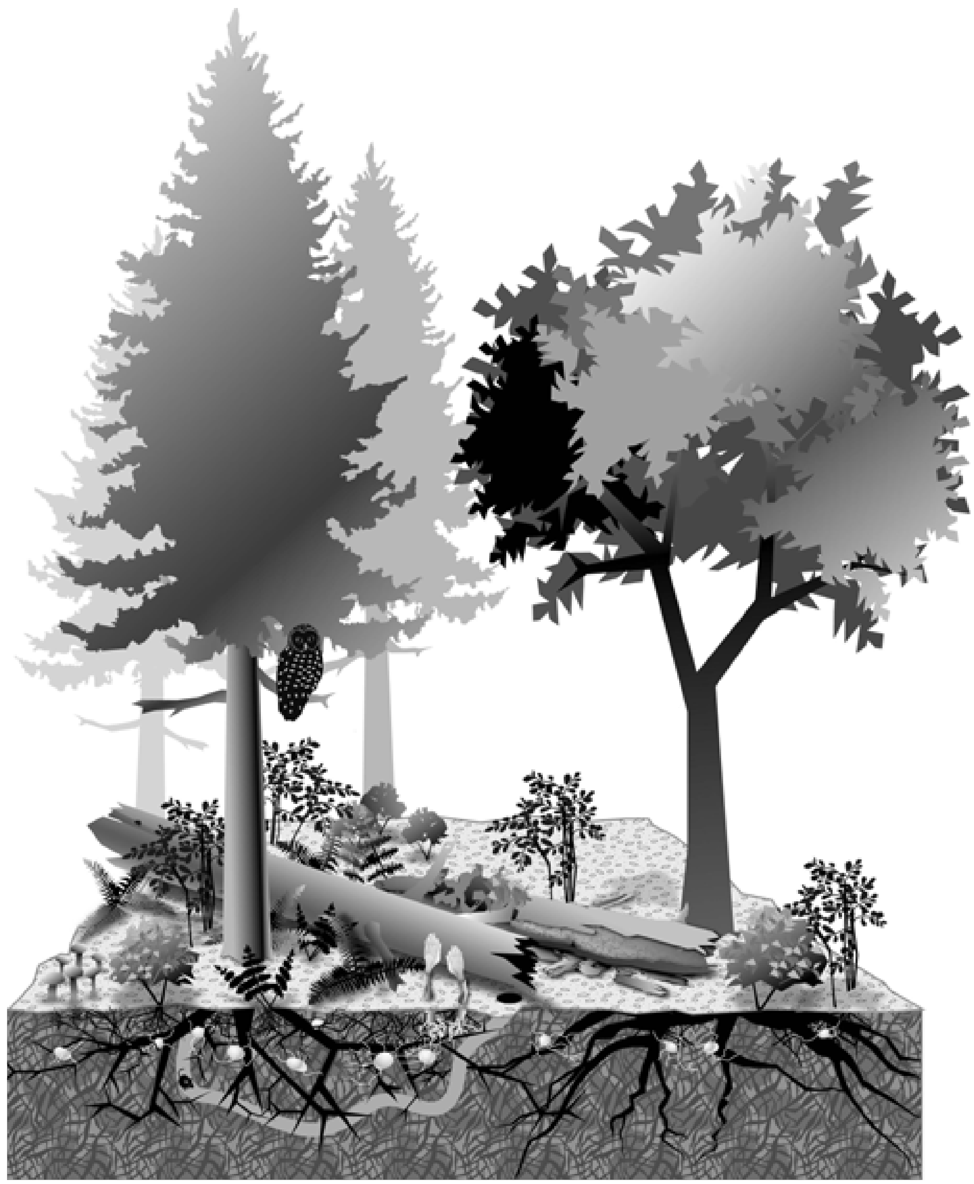
FIELD INSTRUCTIONS

FOR THE ANNUAL INVENTORY OF

CALIFORNIA, OREGON, AND WASHINGTON

2023



FOREST INVENTORY AND ANALYSIS

RESOURCE MONITORING AND ASSESSMENT PROGRAM

PACIFIC NORTHWEST RESEARCH STATION

USDA FOREST SERVICE

THIS MANUAL IS BASED ON:

FOREST INVENTORY AND ANALYSIS

NATIONAL CORE FIELD GUIDE

VOLUME I: FIELD DATA COLLECTION PROCEDURES

VERSION 9.2

Cover image by Gretchen Bracher

Table of Contents

CHAPTER 1 INTRODUCTION

This manual documents data collection procedures, codes, standards, and definitions used by the Pacific Northwest Research Station, Forest Inventory and Analysis (PNW-FIA) program in the 2023 annual forest inventory of California, Oregon, and Washington. PNW-FIA is one of four United States Department of Agriculture (USDA) Forest Service, FIA programs across the country which conducts forest inventories in most of the 50 states and in the Pacific Islands. PNW-FIA is responsible for inventorying the forest resources of Alaska, California, Hawaii, Oregon, Washington, and the Pacific Islands. Field data collection within PNW-FIA is completed by two data collection units: the Portland Forestry Sciences Laboratory (PFSL) and the Anchorage Forestry Sciences Laboratory (AFSL). PFSL is based in Portland, Oregon and is responsible for California, Oregon, and Washington. AFSL is based in Anchorage, Alaska and is responsible for Alaska, Hawaii and the U.S.-affiliated Pacific Islands.

Nationally consistent and uniform Core data measurements are assured by following the procedures outlined in the Forest Inventory and Analysis National Core Field Guide. In addition to the Core data items required by the national FIA program, PNW-FIA measures regional data items that are of interest to the clients and customers of the PNW Research Station.

SECTION 1.1 ORGANIZATION OF THIS MANUAL

This manual is structured primarily for use by field personnel. Each chapter corresponds either to a separate function that must be performed in locating and measuring a field plot, or to a particular aspect of data recording that must be completed. Procedures are ordered to coincide, as much as possible, with the order in which field data are collected and entered into the data recorder.

Core field data collection procedures, listed in the Forest Inventory and Analysis National Core Field Guide, Version 9.2, have been incorporated into this manual. Instructions that are single underlined, tables that are shaded, and data item names followed by CORE and the Core chapter/section number in bold and parentheses, describe data items or field procedures included in the Core field guide. Any regional adjustments are noted *in italic font within the underlined text* or shaded table. Note: all scientific names are shown in italic font. Portions of this manual that are not underlined or shaded describe regional procedures which supplement national Core data. Regional data item names are followed, in bold and parentheses, by the specific inventory (i.e., PACI, AFSL, PFSL, INTAK) or by PNW if the data item applies to all three PNW inventories. When data items are referenced within chapter text, the data item name will appear in all capital letters (e.g., “Record the CONDITION CLASS NUMBER of the condition class in which each tree is located.”).

Database codes have been included in brackets following the data item name. National Information Management System (NIMS) codes are listed for Core data items and regional database codes are listed for regional data items. Note: Core data items containing regional additions (e.g., values, codes) will list “CORE” as the source, but brackets will contain regional database codes; national database codes will be populated from the regional database.

The following examples show how data items will be displayed depending on the source (i.e., Core or regional) of the data item:

ITEM NUMBER; DATA ITEM NAME; **(SOURCE)**; [TABLE.COLUMN NAME]
ITEM X.X.X.X CONDITION CLASS NUMBER (CORE 5.3) [COND.CONDID]..................................Core
ITEM X.X.X.X PRP TYPE (PNW) [TREE.PREV_HT_PNWRS].............................PACI, AFSL and PFSL
ITEM X.X.X.X TREE AGE METHOD (PFSL) [BH_AGE_FLAG_PNWRS]...............................PFSL only
ITEM X.X.X.X TREE TAG NUMBER (PACI, PFSL) [TREE.TAG_NO_PNWRS].......PACI and PFSL only

In addition, the following information is given for each data item:

When collected:	Specific criteria for when data item is recorded
Field width:	X digits
Tolerance:	Acceptable range of measurement
Values:	Legal values/codes for data items

SECTION 1.2 THE INVENTORY

The national FIA program consists of three phases. Phase 1 (P1) is a remote sensing phase aimed at classifying all land into forest and nonforest. Phase 2 (P2) consists of a set of field sample locations distributed across the landscape with approximately one sample location (FIA plot) for every 6,000 acres at standard intensification. Forested sample locations are visited by field crews that collect a variety of forest ecosystem data. Nonforest locations are visited, as necessary, to quantify rates of land use change or to measure regional data items, when specified. This field manual describes the P2 process. Phase 3 (P3) consists of a subset of the phase 2 plots (approximately one every 96,000 acres), which are visited during the growing season in order to collect an extended suite of ecological data including full vegetation census, tree and crown condition, soil data, lichen diversity, coarse woody material, and ozone injury. Data are collected on a subset of plots in all states every year (i.e., annual inventory), as opposed to the historical FIA approach of sampling states sequentially in a cycle (i.e., periodic inventory).

SECTION 1.3 PRODUCTS

PNW-FIA reports on the status and trends of forests in Alaska, Washington, Oregon, California, Hawaii and the Pacific Islands, and provides information sought by resource planners, policy analysts, and others involved in forest resource decision-making. Data collected in PNW-FIA inventories are summarized, interpreted, analyzed, and published in analytical reports and research articles of national, state, regional, and sub-regional scope. Information is presented by forest land and owner classes for land use change; timber volume, growth, mortality, and removals; potential forest productivity; opportunities for silvicultural treatment; and type and area of wildlife habitats.

The data collected in these inventories represent a wealth of information that can answer questions about the status and trend of forest ecosystems, distribution of plant species and their relationship to the environment, the incidence of insects and disease in relation to forest type and condition, changes in forest structure and productivity resulting from disturbance, and improved prediction of forest growth and development on different sites and in response to management.

SECTION 1.4 UNITS OF MEASURE

The *PNW-FIA program* uses ENGLISH units as the measurement system. Previous inventories used metric units. For commonly used conversion factors, see the Metric Equivalents and Aids section in Appendix B (Reference Information).

SECTION 1.5 PLOT DESIGN GENERAL DESCRIPTION

The *Core ground* plot consists of four subplots approximately 1/24 acre in size with a radius of 24.0 feet *horizontal*. The center subplot is subplot 1. Subplots 2, 3, and 4 are located 120.0 feet horizontal at azimuths of 360, 120, and 240 degrees, *respectively*, from the center of subplot 1 (see *Figure 1.1: FIA Phase 2 plot diagram*). *Field plots* also include macroplots that are ¼ acre in size with a radius of 58.9 feet *horizontal*; each macroplot center coincides with the subplot's center. Macroplots are numbered in the same way as subplots. Throughout this field guide, the use of the word 'plot' refers to the entire set of four subplots*/macroplots*. 'Plot center' is defined as the center of subplot 1.

Each subplot contains a microplot of approximately 1/300 acre in size with a radius of 6.8 feet *horizontal*. The center of the microplot is offset 90 degrees and 12.0 feet horizontal from each subplot center. Microplots are numbered in the same way as subplots.

In the PNW-FIA annual inventory, the four subplots/macroplots are laid out in the pattern shown in *Figure 1.1*; subplots are never "substituted" or "moved" in order to keep the entire subplot/macroplot within a homogeneous condition.

SUBSECTION 1.5.1 PLOT LAYOUT

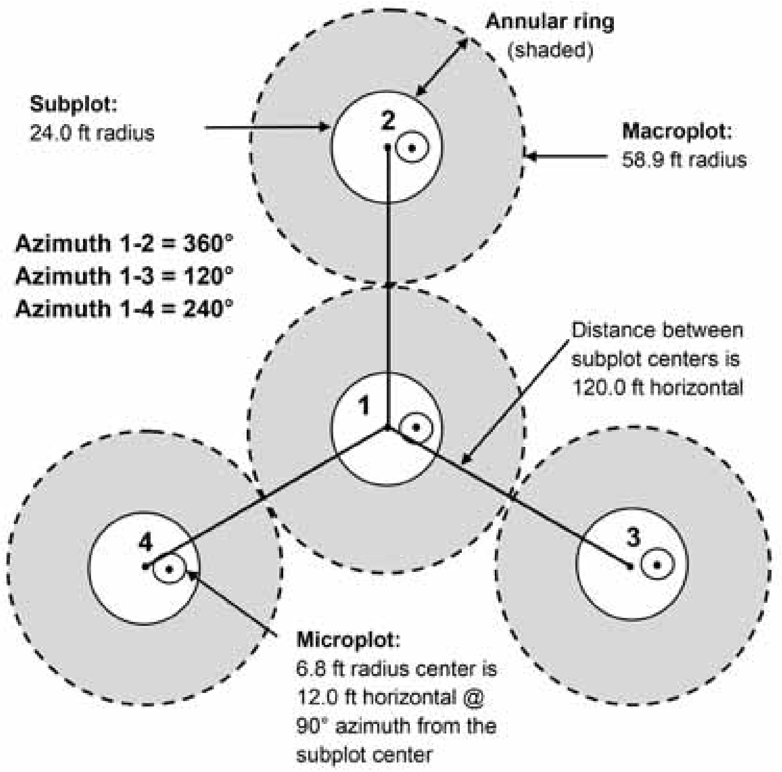


Figure 1.1: FIA Phase 2 plot diagram

SUBSECTION 1.5.2 DATA ARE COLLECTED ON PLOTS AT THE FOLLOWING LEVELS

Plot- Data that describe the entire cluster of four subplots.

Microplot - Data that describe a small area within a subplot.

Subplot - Data that describe a single subplot of a cluster.

Macroplot- Data that describe a single subplot plus an additional annular ring (from 24.0 feet to 58.9 feet) around that subplot center. There are four macroplots on a plot.

Condition Class - A discrete combination of landscape attributes that describe the environment on all or part of the plot. These attributes include:

1. CONDITION CLASS STATUS
2. RESERVED STATUS
3. OWNER GROUP
4. FOREST TYPE
5. STAND SIZE CLASS
6. REGENERATION STATUS
7. TREE DENSITY

Boundary - An approximate description of the demarcation line between two condition classes that occur on a single subplot, microplot, or macroplot. There is no boundary recorded when the demarcation occurs beyond the fixed-radius plots.

Tree - Data describing *live or dead* saplings with a diameter 1.0 inch through 4.9 inches, and *live or dead* trees with diameter greater than or equal to 5.0 inches.

Seedling - Data describing *live* trees with a diameter less than 1.0 inch and greater than or equal to 0.5 feet in length (conifers) or greater than or equal to 1.0 feet in length (hardwoods).

Site Tree - Data describing site index trees.

Vegetation - Data describing plant composition and cover.

Invasive Species - Data describing presence and abundance of invasive plant species.

Down Woody Materials - Data describing abundance and stage of decay of down and suspended dead material.

SECTION 1.6 QUALITY ASSURANCE/QUALITY CONTROL

SUBSECTION 1.6.1 GENERAL DESCRIPTION

The goal of the FIA Quality Assurance/Quality Control (QA/QC) program is to ensure that all resource inventory data are scientifically sound, of known quality, and are thoroughly documented. Measurement quality objectives (MQO) are established as standards to define data quality.

The PNW-FIA QA/QC staff works to continually improve the PNW-FIA inventory process by controlling, identifying, and documenting errors and sources of variability that could be detrimental to the quality of PNW-FIA inventory results. Emphasis is placed on extensive crew training, field inspections, and documentation of protocols and procedures used in the inventory.

Measurement quality and consistency are assessed by using three methods: hot checks, cold checks, and blind plots (see Appendix O for inspection plot descriptions). Periodic on-site inspections of field locations are conducted to ensure that the field work is being performed with the required accuracy and precision. Specifically, objectives of field checking are:

1. To obtain uniform and consistent interpretation and application of field instructions among all field crews.
2. To minimize technique errors.
3. To check the performance of each individual crew member.
4. To reveal inadequacies in the instructions and in the training program.
5. To assess and document the quality (accuracy, precision, completeness) of field data.

CHAPTER 2 LOCATING THE PLOT

This chapter describes the steps taken to locate and establish new FIA plots, and to locate and remeasure previously established FIA plots.

Establishing the plot location is the crucial first step in collecting valid field data. While measurements at each location are used to compile statistical information for the entire inventory, each location is also compared to information derived from processing remotely sensed (e.g., satellite, aircraft) data for the same location. Because these two sampling layers must measure attributes on the same location, the ground sample must be located as accurately as possible.

SECTION 2.1 LOCATING AN ESTABLISHED PLOT

Established plots include:

- Annual inventory (P2) remeasurement plots (SAMPLE KIND = 2, Item 4.3.4.7)
- Field plots established by Forest Health Monitoring (P3) crews using the 4-subplot design
- Periodic revisited plots installed with a different design (Appendix L, Historical Inventory Information, for various plot designs)
- Eastern Oregon Juniper inventory plots (SAMPLE KIND = 2)

The first step in relocating a previously established plot is to find the ground location of plot center (PC) marked on the photos; use resources such as photos, maps/drawings, written descriptions, GPS coordinates (Section 4.4), and reference point (RP) data. Each field crew should have a map with the location of the plots marked and identified with the plot number, and a plot jacket for each plot that may be visited. The county, plot number, and legal description (township, range, and section) are printed on the ownership label on the plot jacket.Use the available resources to reach the general vicinity of the plot. All previously established plots should have an RP from which a slope distance and azimuth to the PC was recorded. This distance and azimuth can be followed from the RP to relocate the PC.

When a previously established plot is difficult to find use the following procedures to re-establish the plot for remeasurement:

- If no trees exist: Use photos, maps, and GPS to verify plot location and treat plot as remeasurement.
- If a major disturbance has occurred with no trees or monumentation remaining: Use photos, maps, and GPS to verify the plot location and consider it a remeasurement plot.
- If some monumentation is present, but not all the trees are found: The plot should be re-established and remeasurement protocol followed.

SUBSECTION 2.1.1 NAVIGATING WITH PHOTOGRAPHY

The plot jacket for each field plot will usually contain photos, supplemental imagery, and maps. The plot center is pinpricked and circled on the old photos. Use both new and old photos to proceed to the plot area when revisiting established plots.

Some photos will be marked with a point-of-departure (POD). They are usually near a road and indicate how the crew approached the plot at a previous visit. In some cases, it may be easier to locate an established plot by heading directly to the plot rather than to the RP because within the plot area there may be numerous "signs" to detect (e.g., trees with reference tags, tree numbers, diameter nails). In searching for the plot, you may find a tagged/numbered tree on one of the subplots; use the plot data from previous visits to determine which subplot you are on.

SUBSECTION 2.1.2 NAVIGATING WITH GPS

Plots visited previously will, in most cases, have field collected GPS coordinates. When using GPS coordinates to navigate, ensure coordinates are entered accurately into the GPS unit using the correct datum and follow your progress on the photo. Compare the GPS navigation readings to other plot location data such as RP to PC distance and azimuth to confirm direction of travel.

If during GPS navigation to the plot you encounter anything that could affect a future crew's travel or safety (e.g., passage around cliffs, shallow stream crossings, illicit activities, game trails, etc.) create a waypoint. Record the waypoint coordinates (Subsection 4.4.3) and provide an explanation in the electronic GPS NOTES.

Refer to Appendix P, GPS Operating Guide, for operation instructions for specific GPS units.

SUBSECTION 2.1.3 NAVIGATING WITH REFERENCE POINT (RP) DATA

Reference points have been established on most previously visited plots; slope distance and azimuth from the RP to the PC were recorded. On some plots, the previous RP referenced a subplot center other than subplot 1, the pinpricked location; on these plots, the plot center monument was still installed at the pinpricked location. See Section 3.3 for monumentation details.

Species, diameter at breast height (DBH) (to the nearest centimeter on periodic PNW-FIA plots), azimuth from RP to PC, and slope distance from RP to PC (in meters on periodic PNW-FIA plots), were recorded on the plot card and on the photo used at the previous visit, and will be in the previous data printout.

The RP will be monumented with square aluminum tags (non-tree RP monumentation will vary). An RP tree will have three square aluminum tags; two at approximately six feet above ground (facing crew's approach), and one below stump height (facing plot center).

Though measuring the distance and azimuth from the RP to the PC may be time consuming, if done carefully, it is a reliable method for relocating field plots.

Before measuring from the RP to the plot center, check photos to see if the azimuth and distance seem reasonable. If reliable GPS coordinates exist, GPS distance and azimuth can be compared to RP data distance and azimuth.

SUBSECTION 2.1.4 REVERSE REFERENCE POINT (RP) METHOD

If the RP cannot be found, but the plot center is found, locate a new RP after remeasuring the plot (time permitting). The tree/object selected should be visible on the photo, preferably between the POD and PC. Record new RP data using the following methods:

- If GPS coverage is very good, collect coordinates for the new RP and enter them in the data recorder. Use the ROUTE function on the GPS to determine the HD and AZ from RP to PC after both PC and RP coordinates have been collected and saved in the GPS unit. This data must also be entered into the data recorder. Pinprick the RP on the digital image, when present, circle the pinprick on the back side and label as RP with the current inventory year.
- If GPS coverage is poor, pinprick the location of the new RP if on the digital image. Use the methods in Subsection 2.4.1 (Locating Plots Using Photos) to determine the horizontal distance and azimuth from RP to PC. Record all the usual RP data in the data recorder.

SECTION 2.2 ESTABLISHED PLOT ISSUES

See Section 2.1, Locating an Established Plot, for definition of established plots.

SUBSECTION 2.2.1 DIFFICULTY FINDING ESTABLISHED PLOTS

If an established plot cannot be found, follow these steps:

1. Return to the last known point on the route to the plot. Plan a route to the pinpricked plot center; divide the route into stages with a physical feature at the end of each stage which can be identified on the photos and confirmed on the ground. Proceed stage by stage, confirming the endpoint of the previous stage before proceeding to the next. The endpoint of the last stage should correspond with the pinpricked location, and be monumented with a center stake and witness trees/snags/stumps/objects. If the plot cannot be found, continue with the following steps.
2. Look for stream confluences, ridges, openings, groups of large trees, old skid roads, large snags, etc. on the ground, to confirm you are at the pinpricked location.
3. Try to locate the area where previous crews might have been when they thought they were at the pinpricked location. Check the previous plot card for remarks providing insight on plot location such as: "Plot center moved back 20 feet on same azimuth to agree with photo pinprick". Look for other indicators such as:
   - Stand type and size of trees
   - The size and species of the RP and subplot 1 witness trees
   - Direction of travel from the RP (it could be 180 degrees off)

- Slope and aspect

4. Previous plot access information (Route to RP and RP Information) should be compared with the original photo pinprick. If these two plot references do not correlate to the same location:
   - Begin a spiral search from where the RP to PC traverse ended; extend up to a 500-foot radius around the ground location.
   - At the same time, use all photos, drawings/maps, previous data, and/or GPS coordinates to aid in relocating.
   - If the ground location of the pinprick is found then begin a spiral search of that area, extending up to a 500-foot radius.
5. If no sign of the plot can be found after an extensive search (at least a day) using all the data and tools available, the plot will be considered lost. See Section 4.1, Lost Plot/Replacement Plot.

SUBSECTION 2.2.2 INCORRECTLY INSTALLED PLOT

Incorrectly installed plots will be relocated or remeasured based on the following criteria:

- **Periodic revisited plots (SAMPLE KIND = 1)**: If the periodic plot center is found or re-established using monumentation, and determined to be installed at an incorrect location (i.e., not at the original photo pinpricked location and off by more than 500 feet), install a new (annual) plot at the original photo pinpricked location. Note: If a plot was installed during the 1980s or earlier and has not been visited since, install the new (annual) plot at the pinpricked location (even if plot center was established at a different location).
- **Remeasurement (SAMPLE KIND = 2)**: Plot is remeasured in its current location, regardless of location errors (i.e., incorrect initial plot location). In this situation, pinprick the actual plot center location on the photos and label the new pinprick on the back of the photo (e.g., “actual plot location”); draw an “X” over the previous pinprick and label (e.g., “initial pinprick location─plot not installed here“). Electronic notes for GPS LOCATION TYPE = 3 must be recorded.

SUBSECTION 2.2.3 INCORRECTLY INSTALLED SUBPLOT OR MICROPLOT

Subplots and microplots are remeasured where they were installed at the previous annual visit, regardless of installation error (see Subsection 3.2.3, New Plot Establishment Tolerances). When a subplot or microplot center is determined to be installed incorrectly, electronic SUBPLOT/MACROPLOT NOTES (Item 6.1.3.5) must be recorded documenting why the installation was in error.

SUBSECTION 2.2.4 PC STAKE OR SUBPLOT/MICROPLOT PIN MISSING OR MOVED

If the PC stake or a subplot/microplot pin is missing or has moved, re-establish the PC stake, subplot pin, or microplot pin at the previously established location using all available information (e.g., previous crew's data sheets, plot card diagrams and descriptions, downloaded tree data in PDR, and any monumentation on the ground). The location of the plot center stake and subplot pins is critical for ensuring that trees do not arbitrarily move in or out of tally between surveys. When a crew has exhausted all efforts to find the PC stake or subplot/microplot pin, use the following guidelines to re-establish plot/subplot/microplot center and provide details of the reinstallation in electronic SUBPLOT/MACROPLOT NOTES:

1. If the PC stake or a subplot pin is not in the previous location (i.e., pulled out of ground or moved) or is missing:
   - Locate the witness trees and any trees that are located nearest to the limiting distances of 24.0 feet and 58.9 feet. Use the slope distances and horizontal distances of these trees to ensure proper stake or pin re-establishment.
   - To ensure optimal precision, the crew should measure out the previous slope/horizontal distances along the back-azimuths from the trees nearest the limiting distances to where PC or subplot center should be. The location where the measured distances converge should be the re-established stake/pin position.
   - If the measured distances do not intersect at one point after verifying the distances and back-azimuths, re-establish the stake/pin at the average point, and record the discrepancies in the electronic SUBPLOT/MACROPLOT NOTES.

For example: Tree A has a horizontal distance of 23.4 feet and a back-azimuth of 270 degrees. Tree B has a horizontal distance of 23.2 feet and a back-azimuth of 90 degrees. Although the measuring tapes extending from the two trees should meet at center, there is a gap of 0.4 feet between them. Re-establish center at the average point between the two tapes, and record the details of the reinstallation in electronic SUBPLOT/MACROPLOT NOTES.

2. If the microplot pin is not in the previous location (i.e., pulled out of ground or has moved), or is missing:
   - Locate any previously tallied saplings using the printout and downloaded data in the PDR. Locate saplings on the edge of the 6.8-foot limiting distance and use them to re-establish the center of the microplot.
   - If there is only one tally sapling on the microplot, measure out 12 feet at 90-degrees from subplot center to temporarily mark the location of microplot center. Measure back to this location from the pith of the sapling using previous distance and azimuth and re-establish the microplot pin based on the temporary pin location and previous tally sapling data.
   - If there are no tally saplings on the microplot, re-establish microplot center 12 feet from subplot center at 90-degrees.

SUBSECTION 2.2.5 LOST SUBPLOT

When an individual subplot is lost (cannot be relocated), re-establish the subplot center pin. CONDITION CLASS STATUS (Item 5.7.0.4) of the new subplot must be updated (if necessary) and previous tree data must be reconciled. See Section 8.5, Tree Tracking, for specific instructions for closing out downloaded tree records on lost subplots.Record details of the lost subplot and procedures used to reinstall the pin in electronic SUBPLOT/MACROPLOT NOTES. Record specific notes pertaining to the tree tally in the individual TREE NOTES. In cases where individual subplots are lost (cannot be located), use the following procedures:

- <u>Assign the appropriate present CONDITION CLASS STATUS Code(s) to the new subplot (usually CONDITION CLASS STATUS = 1 or 2).</u>
- <u>Assign TREE STATUS = 0 to all downloaded trees (i.e., incorrectly tallied at the previous survey).</u>
- <u>Assign RECONCILE code 7 (cruiser error) to all trees on the new subplot.</u>
- <u>Assign the next TREE RECORD NUMBER.</u>

SUBSECTION 2.2.6 LOST PLOT (REPLACEMENT PLOT)

If a previously established annual inventory (4-subplot design) plot (SAMPLE KIND = 2) cannot be found following an extensive search (at least a day) using all the data and tools available, the plot is considered lost; certain procedures must be followed to “close out” the old (lost) plot and replace it with a new plot. See Section 4.1, Lost Plot/Replacement Plot, for specific procedures.

SUBSECTION 2.2.7 P3 PLOTS INSTALLED WITHOUT DECLINATION

If the plot was established as a P3 only (FHM) plot and is now a P2/P3 co-located plot, there is a slight chance the subplots were installed without using declination. If this is the case, remeasure the subplots at the location they were installed. Correct all azimuths on any tally trees or witness objects with new measurements using current rules for declination adjustment (see Appendix B, Reference Information). Recognizing that a plot may have been installed without using declination may also help the crew to re-establish the pins if they are missing.

SECTION 2.3 OTHER PLOTS ESTABLISHED USING THE 4-SUBPLOT DESIGN

SUBSECTION 2.3.1 FHM AND EASTERN OREGON JUNIPER PLOTS

Prior to the annual inventory, FHM (i.e., P3 plots) and eastern Oregon juniper plots were established using the 4-subplot design. In Washington and Oregon most, but not all, of these FHM plots were co-located with periodic inventory and Continuous Vegetation Survey (CVS) plots. In California, this occurred less frequently. Some of these plots were mistakenly installed at different ground locations near the periodic inventory location. When a crew encounters this situation, install the plot as follows:

1. New P2 annual inventory installations located on Region 5 (R5) or Region 6 (R6) Forest Service administered lands in which the CVS, P3, or Eastern Oregon Juniper inventory plots were established at a different ground location: Install the new annual inventory (P2) plot at the CVS plot center (PC).

   Note: The existing P3 plot will be treated as a "lost" plot and re-established with the new annual P2 plot at the old CVS plot center.

2. New P2 annual inventory installations located on all other ownerships where the co-located periodic and P3 plots were established at different ground locations: Install the new annual inventory (P2) plot at the existing P3 plot location.

SUBSECTION 2.3.2 REGION 1 AND REGION 4 PLOTS

PNW field crews measure plots on Region 1 (R1) Forest Service administered lands in Washington (Idaho Panhandle National Forest) and Region 4 (R4) Forest Service administered lands in California (Toiyabe National Forest).

Established annual inventory plots (4-subplot design) on these forests were installed by crews from either PNW or the Rocky Mountain Research Station (RMRS), using protocol from each respective region. Determine whether or not the plot was installed using declination (RMRS does not use declination), and measure the plot and tally trees using the protocol by which the plot was installed; do not move subplots.

If an annual inventory plot has not been established, install a new annual inventory plot (SAMPLE KIND = 1) at the old periodic plot center (if the plot was visited at a previous inventory by either RMRS or PNW) and measure the plot using PNW protocol (i.e., with declination).

Plots on these national forests are only considered remeasurement plots (SAMPLE KIND = 2) when previous data are downloaded into the PDR (i.e., plot was installed or measured by a PNW crew previously). See Appendix L, Historical Inventory Information, for old R1/R4 plot layouts.

Note: Special rules for R5/R6 Forest Service administered lands do not apply when a plot lands on R1/R4 Forest Service administered lands (i.e., **do not measure** nonforest condition classes or ground cover on these lands).

SECTION 2.4 LOCATING NEW PLOTS

Annual inventory plots installed for the first time where no periodic P2 plot previously existed should have digital orthophoto quadrangle (DOQ) or better imagery printouts with the plot center marked—either pinpricked or marked with a dot. Some plots may also have coordinates obtained by digitizing USGS topographic maps. Some plots may contain photos and supplemental imagery, which can be used as an aid in locating plot center. When you arrive at the point you believe to be the PC, carefully check the location on the new photos/imagery against the surrounding terrain and pattern of tree crowns and vegetation to confirm the location on the photo/imagery and your location on the ground are the exact same spot. The new plot should be installed accurately: within +/- 10.0 feet of pinprick on a 1:12,000 or finer scale photo (e.g., 1:5,000), and within +/- 30.0 feet if the photo scale is 1:12,000 or broader (e.g., 1:15,840).

SUBSECTION 2.4.1 LOCATING PLOTS USING PHOTOS

To accurately establish the field location the crew will need to know:

- Photo scale reciprocal (PSR), or scale, to determine ground distances
- Baseline azimuth, an azimuth reference on photo to determine compass bearing

Establishing the photo scale reciprocal (PSR) and a baseline azimuth:

If the photo scale or azimuth reference is not included on the photo it will need to be determined using a baseline (see instructions below).

1. Identify and pinprick two objects on the aerial photo that can also be identified on the ground. The points on the photo should be as close as possible to the center of the photo due to distortion near the edges of aerial photography not orthorectified.
2. Measure the horizontal distance between the objects on the ground to the nearest foot (ground distance).

Note:

- The pinpricked objects on the ground should be at least 500 feet apart.
- The sighting between the pinpricked objects should be straight (such as along a road or across a large opening).
- The elevation of the pinpricked objects on the ground should be similar to the elevation of the plot.

3. Draw a line on the backside of the aerial photo between the two pinpricked objects (the baseline).
4. With a ruler (map units), measure the length of the baseline (map distance).
5. Calculate the photo scale reciprocal (PSR): PSR = ground distance/map distance.
6. Determine the baseline azimuth with a compass by sighting between the two pinpricked objects on the ground. Record the correct azimuth. On the backside of the aerial photo, draw a straight line between a known object (i.e., one of the pinpricked baseline objects) to the pinpricked plot center.

Determine the azimuth and the horizontal distance from the known object to the pinpricked plot center; convert map units to feet using the PSR. Navigate to the plot center using the calculated azimuth and horizontal distance to the pinpricked plot center (will be the center of subplot 1 on the standard layout). If this is a new plot, carefully check the photos against the surrounding terrain and vegetation to make sure you are actually at the location pinpricked on the new photo.

SECTION 2.5 CIRCUMSTANCES PRECLUDING PLOT ESTABLISHMENT/ MEASUREMENT

Active Logging: If the plot area is being actively logged (timber is being felled, bucked, or yarded), **do not establish/measure the plot**. Note the status of the logging operation on the plot jacket and return to the plot when logging activity has ceased.

Plot center (subplot 1) cannot be physically occupied (e.g., Census water, noncensus water, denied access, or hazardous): The subplot will not be installed/measured or referenced; the entire subplot is classified as the subplot center condition, even though a portion of it may be in another condition class. Other subplots are installed/measured using normal procedures (see Subsection 3.4.2, Establishing Subplots When Plot Center is Inaccessible).

- **Note**: If a subplot center (including subplot 1) lands in Census or noncensus water do not install or measure the subplot, **even if it can be occupied safely**.

SECTION 2.6 SKIPPED AND CARRYOVER PLOTS

Plots that cannot be visited due to time constraints and weather will be coded as skipped plots and carried over to the following field season for field measurement. An attempt will be made to access the plot two additional times (i.e., the plot will be on the list of plots for field measurement three times) and then it will be removed from the list of field plots. Include details of the circumstances precluding plot measurement in the plot narrative after the third season on the list of field plots.

CHAPTER 3 PLOT LAYOUT AND REFERENCING

This chapter describes the Forest Inventory and Analysis (FIA) plot design, establishment guidelines, tolerances and procedures used to monument and reference plots and subplots.

SECTION 3.1 PLOT DESIGN

The Core ground plot consists of four subplots with a radius of 24.0 feet horizontal. The center subplot is subplot 1. Subplots 2, 3, and 4 are located 120.0 feet (horizontal) at azimuths of 360, 120, and 240 degrees, respectively, from the center of subplot 1 (see Figure 3.1: FIA Phase 2 plot diagram). Throughout this field manual, the use of the word ‘plot’ refers to the entire set of four subplots/macroplots. ‘Plot center’ is defined as the center of subplot 1.

Each subplot contains a microplot with a radius of 6.8 feet horizontal. The center of the microplot is offset 90 degrees and 12.0 feet horizontal from each subplot center. Microplots are numbered in the same way as subplots.

Ground plots also include macroplots with a radius of 58.9 feet horizontal; each macroplot center coincides with the subplot’s center. Macroplots are numbered in the same way as subplots.

SUBSECTION 3.1.1 PLOT LAYOUT

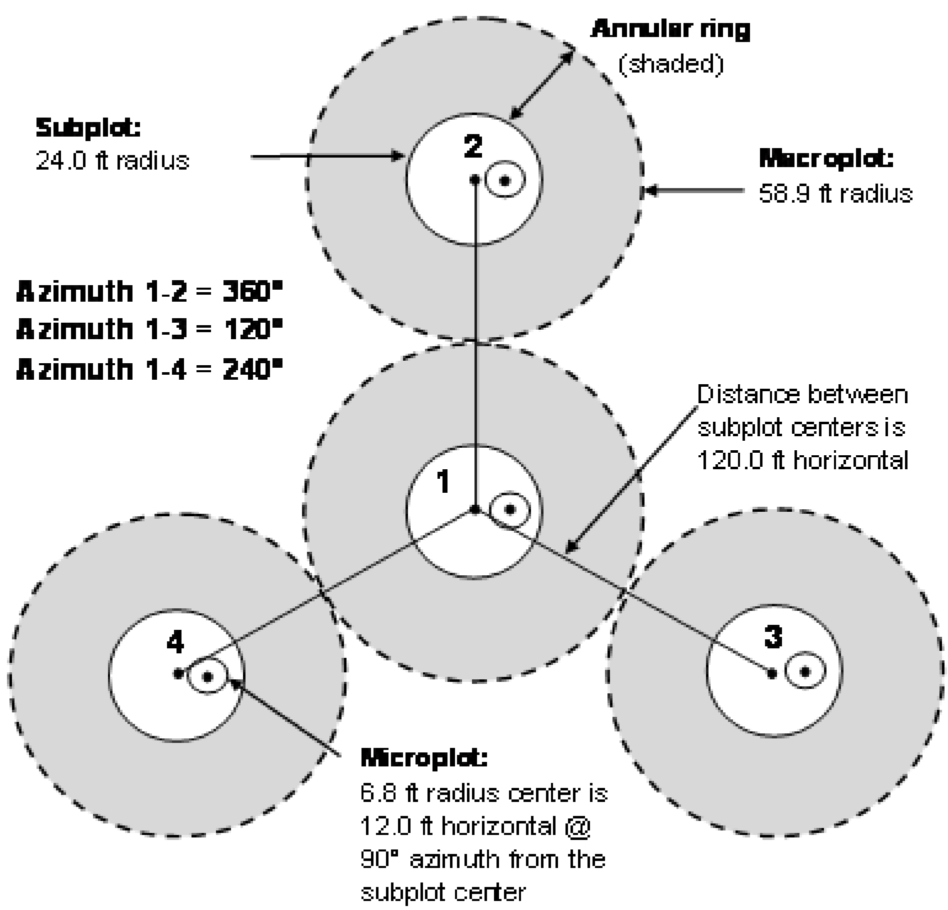


Figure 3.1: FIA Phase 2 plot diagram

<u>The following table can assist in locating subplot*s 2 through 4* from a subplot other than subplot 1.</u>

Subplot	Numbers	Azimuth	Backsight	Distance
From	To	degrees		feet
2	3	150	330	207.8
2	4	210	030	207.8
3	4	270	090	207.8

SUBSECTION 3.1.2 PLOT DIMENSIONS

A. Macroplot – *for sample intensification or sampling relatively rare events*:
- Radius = 58.9 feet
- Area = 10,899 square-feet or 0.25 acre or 1/4 acre

B. Subplot – for sampling landscape-level characteristics, assessing vegetation, tallying trees meeting a minimum diameter at breast height or diameter at root collar:
- Radius = 24.0 feet
- Area = 1,809.56 square feet or approximately 0.04 acre or approximately 1/24 acre

C. Microplot – for counting tree seedlings and tallying tree saplings:
- Radius = 6.8 feet
- Area = 145.27 square feet or approximately 0.003 acre or approximately 1/300 acre

D. Annular plot – outer ring of the macroplot; adds area to the subplot for sampling relatively rare events:
- Radius = from 24.0 feet to 58.9 feet
- Area = 9088.4 square feet or approximately 0.21 acre or 5/24 acre

SECTION 3.2 PLOT ESTABLISHMENT

SUBSECTION 3.2.1 PLOT ESTABLISHMENT GUIDELINES

Establish the ground plot at the location corresponding to the pinprick on the photo, as described in Section 3.1, Plot Design. In the annual inventory the four subplots are laid out in the pattern shown in Figure 3.1: FIA Phase 2 plot diagram.

When the crew cannot occupy the plot center because safety hazards exist, or the plot center is inaccessible or out of the sample, the crew should check the other subplots. See Section 2.5 Circumstances Precluding Plot Establishment/Measurement, for installation instructions when a safety hazard exists. If any subplot centers can be occupied and are in the sample, the subplots that can be occupied should be established and sampled following normal procedures. When a subplot center or microplot center cannot be occupied, no *measurements will be taken on* that subplot or microplot; instead, the entire subplot or microplot should be classified according to the condition preventing occupancy. However, if a localized obstruction (e.g. tree stem, boulder) prevents subplot/microplot center occupancy, measure the subplot or microplot using best estimate distances for references and trees. Document the situation in Item 6.1.3.5, SUBPLOT/MACROPLOT NOTES (PNW). See Item 6.1.1.3, SUBPLOT/MACROPLOT STATUS (CORE 3.4) for examples of coding data items in specific situations.

> **Note**: If a subplot center (including subplot 1) is classified as noncensus water (CONDITION CLASS STATUS = 3) or Census water (CONDITION CLASS STATUS = 4), no measurements are taken on that subplot, even if it can be occupied safely (i.e., regardless of water level, a subplot center covered by noncensus or Census water cannot be “occupied”).

If a *remeasurement (*SAMPLE KIND = 2*)* subplot *or microplot* was installed incorrectly at the previous visit, the current crew should remeasure the subplot *or microplot* in its present location. Periodic revisited plots (SAMPLE KIND = 1 and PNW PLOT KIND = 2 or 3; see Appendix L, Historical Inventory Information) will be remeasured using the current plot center location unless placement exceeds tolerance (i.e., ground plot is more than 500 feet from the original pinpricked location on the photo). Notes are required, both on the plot card and in SUBPLOT/MACROPLOT NOTES, when previously mislocated subplots are encountered.

In cases where individual subplots are lost (cannot be relocated), *see Subsection 2.2.5, Lost Subplot, for instructions.*

SUBSECTION 3.2.2 PLOT INTEGRITY

Each FIA unit is responsible for minimizing damage to current or prospective sample trees and for specifying how these trees are monumented for remeasurement. The following field procedures are permitted:

- Nailing tags on witness trees so that subplot centers can be relocated.
- Boring trees for age on subplots and macroplots to determine tree age, site index, stand age, or for other reasons.

- Nailing and tagging trees on microplots, subplots, and macroplots so that these trees can be identified and relocated efficiently and positively at times of remeasurement.
- Nailing or painting microplot, subplot, and macroplot trees so that the point of diameter measurement can be accurately relocated and remeasured.

All other potentially damaging procedures that may erode subplot integrity are prohibited.

The following practices are specifically prohibited:

- Boring and scribing some specific tree species that are known to be negatively affected (e.g., the initiation of infection or callusing).
- Chopping vines from tally trees. When possible, vines should be pried off trunks to enable accurate measurement. If this is not possible, alternative tools (calipers, biltmore sticks) should be used.

Note: Avoid becoming part of the problem! There is a risk that field crews walking into plot locations could pick up seeds along roadsides or other patches of invasive plants and spread them through the forest and on to the plot. Be aware of the vegetation you are traveling through and consider stopping and removing seeds from boots and clothing before entering uninvaded lands, particularly remote areas that are rarely visited.

SUBSECTION 3.2.3 NEW PLOT ESTABLISHMENT TOLERANCES

Plot center (center of subplot 1): +/- 10.0 feet of pinprick on a 1:12,000 or finer scale photo (e.g., 1:5,000); +/- 30.0 feet if the photo scale is 1:12,000 or broader (e.g., 1:15,840)

Subplot 2, 3, or 4: +/- 5 feet

Microplot: +/- 0.5 feet

SECTION 3.3 MONUMENTING AND REFERENCING PLOT CENTER

All ground visited plots are monumented at plot center and referenced by a reference point (RP) and two witness trees/objects. Install a cedar stake at the plot center (PC, center of subplot 1); see Subsection 3.3.3, Exceptions to Monumenting Plot Center, for valid exceptions to this rule. Use a small aluminum nail to attach a round tag (yellow-side up) to the top of the cedar stake.

If previously established, the plot was monumented at last visit with a cedar or plastic stake in the ground at PC and was referenced by an RP and two nearby witnesses—marked distinctively with square or round tags. If necessary (e.g., stake is broken), remove the old stake and install a new cedar stake at exactly the same location as the old stake, and update witness measurements.

Note: Monumenting and referencing protocol for entirely nonforest plots and plots in wilderness areas or national parks differs from standard protocol; see Section 3.5 (Monumenting and Referencing Entirely Nonforest Plots) through Section 3.7 (Monumenting and Reference Plots in National Parks) for monumenting and referencing guidelines for these areas.

SUBSECTION 3.3.1 THE REFERENCE POINT

The reference point references the plot center monument, a cedar stake marking PC, on all field visited plots. It is an object (usually a tree) that is easily identified on the aerial photo and on the ground, and likely to be present at the next visit. Do not reference a subplot other than the one with the plot center monument just because that subplot is closer to the RP. The RP may reference a subplot other than subplot 1 only when there is a significant obstacle or other obstruction between the RP and subplot 1, or when a subplot other than subplot 1 has the center monumentation (see Subsection 3.3.3, Exceptions to Monumenting Plot Center).

Select an RP: The RP should be distinctive both on the ground and on the digital imagery. The previous RP tree may be reused, if it is still suitable. If the old RP tree is dead, missing, or difficult to identify on the ground or on the photo, select a new RP and leave the tags on the old RP. If possible, it should be a tree that is not likely to die or be cut before the next inventory, although a snag or other object may be selected as an RP (e.g., a distinctive fence post, building corner). If such an RP is utilized, describe it in Item 4.3.8.1, PLOT ACCESS DESCRIPTION (PNW).

Tag the RP: Attach three square aluminum tags to the RP tree; old tags may be reused, if suitable. Nail two tags six feet above ground line; facing the direction(s) from which you expect future crews to approach the RP. Nail one square tag below stump height on the side of the tree facing the plot center monument. Nails should be driven in only enough to anchor them firmly into the wood. If the RP is a building, rock, or other item that should not be tagged, include a description in the Plot Access Description and in the RP NOTES (Item 4.3.7.7).

In addition to monumenting the RP, the following must be completed:

- Written description (to the RP and to the plot) recorded in Item 4.3.8.1, PLOT ACCESS DESCRIPTION (PNW).
- RP pinpricked on the digital image and labeled with current inventory year.
- RP data recorded in the data recorder, noting any irregularities in the RP NOTES. See Subsection 4.3.7, Reference Point Attributes, for specific guidelines and data items.

SUBSECTION 3.3.2 WITNESS TREES/OBJECTS

All ground visited plots will have two witness trees/objects referencing plot center (see Subsection 3.3.3, Exceptions to Monumenting Plot Center, for exceptions to this rule). Witness the PC monument and subplot pins as follows:

A. **Selecting witnesses:**Select two trees/objects near the subplot center which form, as closely as possible, a right angle with the center marker. Trees/objects within six feet of the subplot center are preferable. If live trees are not available, use similarly sturdy objects that have a low likelihood of moving or rapidly decaying. On previously established subplots, reuse the previous witnesses unless better trees/objects are available.

B. **Monumenting witnesses:** Monumentation procedures vary depending on the subplot being witnessed; plot center (PC, center of subplot 1) has different monumentation than subplots 2 through 4 (Table 3.1: Hardware for subplot witness monumentation). When attaching a tag to a live witness tree, drive the nail into the tree only enough to anchor the nail firmly into the wood. On previously established subplots, renew old witness tags as needed. If a witness is replaced, remove old tags to avoid confusion at subsequent visits. Note: Do not remove previous R6 CVS monumentation.

Table 3.1: Hardware for subplot witness monumentation

Subplot	Hardware
Plot Center (PC, Subplot 1)	Silver aluminum square tags. If the witnesses are also numbered tally trees, attach the tree number tags with the same nails (i.e., numbered tag on top of square tag).
Subplots 2 - 4	Two-color round aluminum tags with yellow side out.

Table 3.2: Standards for monumentation of various witness types

Witness Type	Standards
Live tally tree greater than or equal to 3.0 inches DBH/DRC	Attach one tag below stump height facing subplot center, and attach tags six feet above ground height facing the direction of anticipated approach to the subplot. Note: avoid using tally saplings unless no other trees are available. If saplings must be used, wire the tag to an ancillary branch.
Dead tally tree	Attach one tag below stump height facing subplot center, and attach tags six feet above ground height facing the direction of anticipated approach to the subplot. Pound nails flush with the bole of the snag.
Non-tally tree	Attach one tag below stump height facing subplot center, and attach tags six feet above ground height facing the direction of anticipated approach to the subplot. If the witness is a live tree greater than or equal to 3.0 inches DBH/DRC, attach an aluminum nail at the diameter measurement point. If saplings must be used, wire the tag to an ancillary branch facing subplot center.
Stump (i.e., less than 4.5 feet tall)	Attach a yellow round tag below stump height facing plot center. Attach another tag centered on the top/cut face of the stump. When nailing tags to stumps, pound nails flush to the bole. Tags nailed to stumps stay attached longer if bark is removed prior to nailing the tag.
Shrub	Nail or wire a yellow round tag to the base of the shrub facing subplot center. If possible, nail or wire additional rounds higher in the shrub facing the direction of expected approach to the subplot.
Other objects	Monument as appropriate for the object.

Note: Stump height is 0.5 feet above ground level.

Note: PC always gets two tags six feet above ground level facing the direction of anticipated approach unless not possible; one or two tags should be placed up high on subplots 2-4 facing the direction of approach.

SUBSECTION 3.3.3 EXCEPTIONS TO MONUMENTING PLOT CENTER

The plot center monument is not placed at the center of subplot 1 (plot center) if either of the following situations occur:

- The center of subplot 1 is too hazardous to visit (e.g., subplot center 1 is in the middle of a pond, the middle of a freeway, or on the side of a cliff)

OR

- Placing the plot center monument at the center of subplot 1 is likely to irritate a landowner (e.g., subplot 1 center is in the middle of someone's front lawn)

THEN: Reference the center of the lowest-numbered subplot on which the above exceptions do not apply. Record an electronic PLOT NOTE stating which subplot was monumented.

SECTION 3.4 MONUMENTING AND REFERENCING SUBPLOTS 2 THROUGH 4

Accessible subplots that have a forest land condition class present on the 58.9-foot fixed-radius macroplot, and accessible subplots with an accessible, measurable nonforest condition class (NONFOREST CONDITION CLASS SAMPLING STATUS =1) present on the macroplot, also require referencing (see Table 3.1: Hardware for subplot witness monumentation).

SUBSECTION 3.4.1 LOCATE AND MONUMENT SUBPLOT CENTER

Subplots 2, 3 and 4 are located at 360, 120, 240 degrees respectively (see Subsection 3.1.1, Plot Layout).

Mark subplot center: Place a metal pin and aluminum round, yellow side up, at the ground location of subplot center. Tie a small piece of flagging to the pin under the aluminum round.

Reference witnesses: Reference the metal pin to two nearby witnesses (see Table 3.2: Standards for monumentation of various witness types).

SUBSECTION 3.4.2 ESTABLISHING SUBPLOTS WHEN PLOT CENTER IS INACCESSIBLE

When plot center is inaccessible (e.g., hazardous due to cliffs, falls in census water), but one or more of the other subplot centers is accessible, establish all accessible subplots by using the offset procedures described below.

In the following example, plot center (PC) is inaccessible, but subplots 2 and 3 are in accessible forest land. All of subplots 1 and 4 are classified as CONDITION CLASS STATUS = 5 (nonsampled). Subplot 2 and subplot 3 must be established since they are in accessible forest land (see Figure 3.2: Inaccessible plot center).

Example: The course from RP to PC is 235 degrees for 230 feet. The cliff is encountered at 198 feet; 32 feet short of PC. To establish subplot 2, proceed 360 degrees for 120 feet, then proceed on the original azimuth (235 degrees) for the remaining 32 feet to the center of subplot 2. To establish subplot 3: start where the original course from RP to PC ended; go 120 degrees for 120 feet; then go 235 degrees for 32 feet to the center of subplot 3.

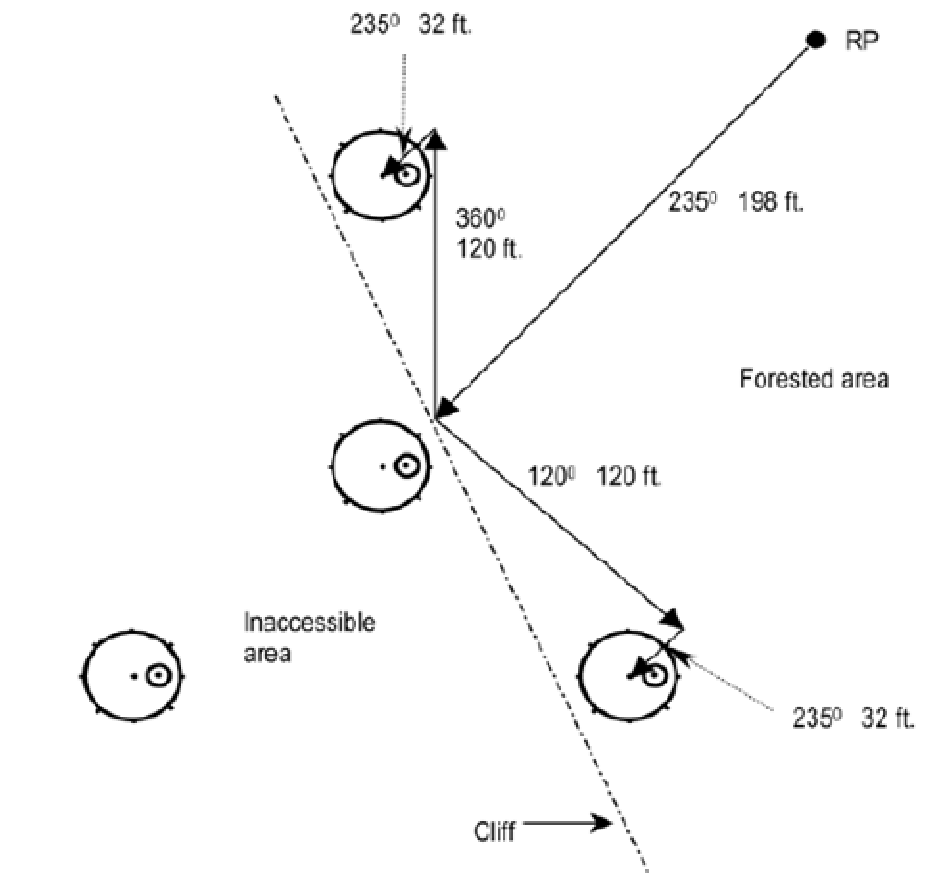


Figure 3.2: Inaccessible plot center

SUBSECTION 3.4.3 LOCATE AND MONUMENT THE MICROPLOT

The center of each 6.8-foot fixed-radius microplot is located 12 feet horizontal from each subplot center at 90 degrees (see Subsection 3.1.1, Plot Layout). Place a metal pin with aluminum round (white side up) at microplot center. Tie a small piece of flagging to the pin under the aluminum round.

SECTION 3.5 MONUMENTING AND REFERENCING ENTIRELY NONFOREST PLOTS

SUBSECTION 3.5.1 NONFOREST PLOTS

Plots on R5 or R6 Forest Service administered lands that are entirely nonforest and are ground visited must be referenced on all four subplots. Follow the steps in Section 3.3 (Monumenting and Referencing Plot Center) and Section 3.4 (Monumenting and Referencing Subplots 2 through 4).

SUBSECTION 3.5.2 NONFOREST PLOTS WITHOUT MEASURABLE NONFOREST

Plots that are entirely nonforest and are ground visited must be referenced at plot center. Follow the steps in Section 3.3 (Monumenting and Referencing Plot Center) to reference the plot center. Subplots 2 through 4 do not need to be referenced if the entire plot is nonforest.

SECTION 3.6 MONUMENTING AND REFERENCING PLOTS IN WILDERNESS AREAS

Plots located in wilderness areas require special monumenting procedures to be sensitive to the existing character of these areas and to leave as few signs of human disturbance as possible.

The crew should prepare a very detailed plot diagram, showing the RP, other physical features, and a well defined route-to-plot narrative to facilitate relocation and to mitigate the lack of visual reference points normally used to reference plots. Record detailed notes about the monumenting procedures in Item 4.3.8.1, PLOT ACCESS DESCRIPTION (PNW).

SUBSECTION 3.6.1 FOREST SERVICE AND BUREAU OF LAND MANAGEMENT WILDERNESS AREAS

All plot monumentation materials (nails, pins, tags) **must be painted** with non-glossy brown paint (black and gray are also acceptable in Forest Service wilderness areas). Any flagging used to facilitate plot measurements, or entry and exit from the plot area, must be removed upon completion of the plot measurements.

The RP is not monumented.

Plot center (subplot 1) is monumented with a cedar stake and/or a rock cairn. It is referenced from two permanent witness features (trees or rocks), but no round aluminum or square tags may be used on trees.

Subplots 2, 3, and 4 centers are monumented with a regular metal pin and a painted round aluminum tag. Where rocks are available, rock cairns are used to obscure these markers on the ground; make natural appearing cairns to hide the monumentation. The microplot is not monumented with a metal pin.

All live or dead tally trees greater than or equal to 1.0 inch DBH/DRC are tagged with a painted aluminum tree number tag at the base or hanging on a branch if a sapling less than 3.0 inches DBH. Mark tally trees greater than or equal to 3.0 inches DBH/DRC with similarly painted nail at DBH/DRC. Trees less than 3.0 inches DBH/DRC are marked with an orange paint stik at DBH/DRC.

SECTION 3.7 MONUMENTING AND REFERENCING PLOTS IN NATIONAL PARKS

Plots located in national parks require special monumenting procedures to be sensitive to the existing character of these areas and to leave as few signs of human disturbance as possible.

SUBSECTION 3.7.1 NATIONAL PARKS

Refer to the collections permit for the specific national park, or the approved procedures agreed upon between PNW-FIA and the individual park unit, for instructions on how to monument plots on all NPS lands. It is the crews' responsibility to read the entire permit and to verify monumentation protocol with the administrator of the permit for that park.

CHAPTER 4 PLOT LEVEL DATA

Plot attributes record information about the plot location and the field crew visit. This information aids future crews in plot relocation, sets up date and inventory cycle information in the data recorder, and makes it possible to analyze the relationship of plot data to other mapped data (e.g., rivers).

All *data items* listed in *this chapter* are collected on plots with at least one accessible forest land condition (PLOT STATUS = 1) and all *nonforest/nonsampled* plots (PLOT STATUS = 2 or PLOT STATUS = 3). In general, plot level data apply to the entire plot and are recorded from the center of subplot 1. A plot is considered nonforest if no part of it is currently located in forest land (CONDITION CLASS STATUS = 1). A plot is nonsampled if the entire plot is not sampled for one of the reasons listed in PLOT NONSAMPLED REASON.

If a forest plot has been converted to nonforest or becomes a nonsampled plot, the previous data are reconciled and an attempt is made to visit the plot during the next inventory. If a nonforest plot becomes forest or access is gained to a previously nonsampled plot, a new forest ground plot is installed. All nonforest and nonsampled plots are visited if there is any reasonable chance that they might include some forest land condition class.

Trees on previously forest land plots will be reconciled during data processing. There is a distinction between plots that have been clearcut, and plots that have been converted to another land use. A clearcut plot is considered forest land until it is actively converted to another land use. Additional information concerning land use classifications is contained in Section 5.5, Condition Class Attributes.

SECTION 4.1 LOST PLOT/REPLACEMENT PLOT

Plots that cannot be relocated by using the guidelines in Section 2.2, Established Plot Issues, are considered lost; certain procedures must be followed to “close out” the old (lost) plot and replace it with a new plot.

- **Periodic revisited plots** - Install a new annual plot at the location of the original PI photo pinprick or the digitized coordinates of that pinprick if there are no photos. Locating and laying out the replacement plot should be performed as if installing the plot for the first time. Note: Periodic plots include any FIA, R1, R4, R5, R6, or BLM plots.
- **Remeasurement plots** (SAMPLE KIND = 2) - see Subsection 4.1.2, Replacement Plot for specific procedures.

SUBSECTION 4.1.1 LOST ANNUAL PLOT

If a previously established annual inventory (four-subplot design) plot (SAMPLE KIND = 2) cannot be found, the plot is considered lost and the state coordinator must be notified.

1. Close out the lost annual plot:
    - If trees were recorded: Use coding procedures for lost plots listed under Item 4.3.4.2.
    - If trees were recorded and there is no evidence of disturbance: Document factors you believe contributed to the plot being lost in Item 4.3.8.2, PLOT NARRATIVE (PNW).
    - If trees were recorded and there is evidence of disturbance: efforts to locate plot must be documented and the state coordinator notified. Document factors you believe contributed to the plot being lost in Item 4.3.8.2, PLOT NARRATIVE (PNW). An explicit description of the percentage of mortality and cause of death of trees must be recorded; the plot will be reviewed by analysts at the end of the season.
2. Install a replacement plot (see Subsection 4.1.2, Replacement Plot).

SUBSECTION 4.1.2 REPLACEMENT PLOT

Once a lost annual plot is closed out (see Subsection 4.1.1, Lost Annual Plot), a replacement plot must be installed at the ground location marked by the original PI photo pinprick or the digitized coordinates of that pinprick if there are no photos. Create a new plot file for the replacement plot (SAMPLE KIND = 3); a new (or surrogate) PLOT NUMBER will be assigned (see Item 4.2.1.3).

Locating and laying out a replacement plot should be performed as if installing the plot for the first time. Notify the data manager before sending any replacement plots to the office.

SECTION 4.2 PLOT LEVEL DATA DOWNLOADED TO THE PDR

Do not change the downloaded code for the following data items. If instructed, verify the code is correct and if it isn't, contact the local QA staff member.

SUBSECTION 4.2.1 PLOT LEVEL DATA ITEMS

Item 4.2.1.1 STATE (CORE 1.1)
[PLOT.STATECD]

The unique *Federal Information Processing Standard (*FIPS*)* code identifying the *STATE* where the plot center is located.

When collected:	All plots	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	State
	06	California
	16	Idaho (used for R6 administered plots in Idaho)
	32	Nevada (used for R5 administered plots in Nevada)
	41	Oregon
	53	Washington

Item 4.2.1.2 COUNTY (CORE 1.2)
[PLOT.COUNTYCD]

The unique FIPS code identifying the county where the plot center is located.

When collected:	All plots
Field width:	3 digits
Tolerance:	No errors
Values:	See Appendix B

Item 4.2.1.3 PLOT NUMBER (CORE 1.3)
[PLOT.PLOT]

The identification number, unique within *the state, assigned to* each plot*; this item is populated when the plot file is created or extracted in the data recorder*. If SAMPLE KIND = 3 *(Replacement Plot)*, the plot number will be assigned by *the mobile integrated data acquisition system (MIDAS).* If the MIDAS number is not readily available, 99999 will be used as a surrogate number until a new PLOT NUMBER can be appropriately assigned.

Note: If a replacement plot file needs to be created (see Subsection 4.1.2, Replacement Plot), the new plot number assigned by MIDAS (or 99999 as a surrogate) will be entered when opening the new plot file. Do not change the downloaded code within plot attributes.

When collected:	All plots
Field width:	5 digits
Tolerance:	No errors
Values:	00001 to 99999

Item 4.2.1.4 CYCLE (PNW)
[PLOT.CYCLE]

This code identifies the cycle number of the current plot.

When collected:	All Plots
Field width:	2 digits
Tolerance:	No errors
Values:	01-99

Item 4.2.1.5 SUBCYCLE (PNW)
[PLOT.SUBCYCLE]

This code identifies the subcycle of the plot.

When collected:	All Plots
Field width:	2 digits
Tolerance:	No errors
Values:	01-10

Item 4.2.1.6 PERIODIC PLOT NUMBER (AFSL, PFSL)
[PLOT.PERIODIC_PLOT_NBR_PNWRS]

This code identifies the plot number (if any) used for this location at previous periodic inventories. Do not change the downloaded/printed code. Verify downloaded code with the code on the label of the plot jacket. Notify the PDR programmer if a difference exists.

When collected:	Downloaded when plot has been assigned a plot number at previous periodic inventories
Field width:	3 digits
Tolerance:	No errors
Values:	000-999

Item 4.2.1.7 NFS PLOT NUMBER (PFSL)
[PLOT.NFS_PLT_NUM_PNWRS]

Downloaded for all plots on R5 and R6 Forest Service administered lands, including those with an FIA PLOT NUMBER (Item 4.2.1.3). Confirm the downloaded value is correct. If the downloaded NFS PLOT NUMBER does not match the one on the plot jacket, contact the PDR programmer.

When collected:	Downloaded when condition class 1 has ADMINISTRATIVE FOREST CODE = 501 - 699
Field width:	5 digits when ADMINISTRATIVE FOREST CODE is 501 - 599
	7 digits when ADMINISTRATIVE FOREST CODE is 601 - 699
Tolerance:	No errors
Values:	0000001 to 6999999

Item 4.2.1.8 FIELD GUIDE VERSION (CORE 1.12)
[PLOT.MANUAL]

This code identifies the version number of the *Forest Inventory and Analysis* National Core Field Guide that was used to collect the *annual inventory* data on this plot. *This* will be used to match collected data to the proper version of the field guide. The 2023 FIELD GUIDE VERSION is 9.2.0.

When collected:	All plots
Field width:	*3* digits (x.y)
Tolerance:	No errors
Values:	9.2.0

Item 4.2.1.9 PDR STARTING DATA RECORDER VERSION NUMBER (PNW)
[PLOT.PDR_START_VERSION]

A 30-digit field identifying the version number of the data recorder program used at the current visit to collect data on the plot on the day the plot was started, in the format a.b.c.d.REGION.e. The **a** signifies the national field guide version, and **b** signifies the minor national field guide version. The **c** represents the main national MIDAS build version, and the **d** represents the main national MIDAS revision number. The REGION code will be PNW for our region. The **e** represents the regional version number of MIDAS. As an example 6.0.1.3.PNW.5 represents version 6.0 of the national manual, and it is the first major build of MIDAS, and the 3rd national revision. It also signifies the 5th update of the MIDAS application for PNW. The regional version number will be recycled back to “0” when the main national field guide version is updated, for example, when Core Field Guide 8.0 is implemented.

When collected:	Generated for all plots
Field width:	30 digits
Tolerance:	No errors
Values:	a.b.c.d.REGION.e (starting at 7.0.2.3.PNW.1)

Item 4.2.1.10 PDR ENDING DATA RECORDER VERSION NUMBER (PNW)
[PLOT.PDR_END_VERSION]

A 30-digit field identifying the version number of the data recorder program used at the current visit to collect data on the plot on the day the plot was completed. See Item 4.2.1.9, PDR STARTING DATA RECORDER VERSION NUMBER, for a description of the naming convention of values for this data item.

When collected:	Generated for all plots
Field width:	30 digits
Tolerance:	No errors
Values:	a.b.c.d.REGION.e (starting at 7.0.2.3.PNW.1)

Item 4.2.1.11 DECLINATION (CORE OPTIONAL 1.14)
[PLOT.DECLINATION]

The azimuth correction used to adjust magnetic North to true North *is downloaded into the PDR*. All azimuths are assumed to be magnetic azimuths unless otherwise designated. This field carries a decimal place because the USGS corrections are provided to the nearest half degree.

DECLINATION is defined as: DECLINATION = (TRUE NORTH - MAGNETIC NORTH)

For plots in California, Oregon, and Washington, azimuths are always in relation to true North. The declination adjustment used for each plot will be downloaded/printed, and is listed by county in Appendix B. This adjustment is made in the field by setting the declination for the plot to “East declination” on the compass. Do not change the downloaded/printed code.

When collected:	*Downloaded for* all plots
Field width:	5 digits including sign (+xxx.y)
Tolerance:	No errors
Values:	013.0 to 015.0 (Oregon)
	013.5 to 015.5 (Washington)
	011.0 to 014.0 (California)
	013.0 to 015.0 (Idaho)
	011.0 to 014.0 (Nevada)

Item 4.2.1.12 MACROPLOT BREAKPOINT DIAMETER (CORE OPTIONAL 1.20)
[PLOT.MACROPLOT_BREAKPOINT_DIA]

A macroplot breakpoint diameter is the diameter (either DBH or DRC) above which trees are measured on the plot extending from 0.1 to 58.9 feet (horizontal distance) from the center of each subplot. The Pacific Northwest FIA unit uses breakpoint diameters of 24 inches and 30 inches (24 inches throughout California; and 24 inches on the east side, 30 inches on the west side of the Cascade Range in Oregon and Washington). Breakpoint diameter will be downloaded for each plot.

When collected:	Downloaded for all plots
Field width:	2 digits
Tolerance:	No errors
Values:	24, 30

Item 4.2.1.13 CHANGE MATRIX REQUIRED (PNW)
[PLOT.CHANGE_MATRIX_REQUIRED_PNWRS]

A downloaded code, indicating if remeasurement protocol (Section 5.6) should be followed. This code cannot be changed in the field.

When collected:	All plots
Field width:	1 digit
Tolerance:	No errors

Values:	Code	Description
	N	Change matrix not required
	Y	Change matrix required

Item 4.2.1.14 PREVIOUS DATA CORRECTABLE (PNW)
[PLOT.PREV_DATA_CORRECTABLE_PNWRS]

This downloaded code is used to identify plots allowing previous visit data to be corrected when there is an error in PREVIOUS CONDITION STATUS, PREVIOUS RESERVED STATUS or PREVIOUS OWNER GROUP, or a correctable error in previous boundary mapping. Data items that may be corrected include Previous Condition Class Attributes, Previous Boundaries, PREVIOUS SUBPLOT/MACROPLOT CENTER CONDITION, PREVIOUS MICROPLOT CENTER CONDITION, etc.

When collected:	When SAMPLE KIND = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	N	Previous data is reconciled in the CHANGE MATRIX only
	Y	Previous condition, boundaries, subplot center condition and microplot center condition data is corrected when previous crew made an error.

Item 4.2.1.15 P2 VEGETATION SAMPLING STATUS (CORE OPTIONAL 1.22.1)
[PLOT.P2VEG_SAMPLING_STATUS_CD]

This *downloaded* plot-level variable determines whether P2 Vegetation data (*Chapter 12, Vegetation Profile*) will be recorded on the plot and the land condition class(es) on which it will be recorded. In California, Oregon, and Washington, vegetation data is collected on all accessible forest land and accessible, measurable nonforest conditions.

When collected:	All plots	
Field width:	1 digit	
Tolerances:	At least 99 percent of the time	
Values:	Code	Definition
	0	Not sampling P2 Vegetation
	1	P2 Vegetation data collected only on accessible forest land conditions (CONDITION CLASS STATUS = 1 and NONFOREST SAMPLING STATUS = 0)
	2	P2 Vegetation data collected on all *measured* land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)

Item 4.2.1.16 LEVEL OF DETAIL (CORE OPTIONAL 1.22.2)
[PLOT.P2VEG_SAMPLING_LEVEL_DETAIL_CD]

This *downloaded* plot-level variable determines whether data are collected for vegetation structure only or for Species Composition as well. If LEVEL OF DETAIL = 3, then a tree species could be recorded twice, but it would have two different species growth habits (see Item 12.4.0.8, SPECIES GROWTH HABIT (CORE OPTIONAL 8.5.1)). Alaska, PFSL, and the Pacific Islands use LEVEL OF DETAIL = 3 for all plots where vegetation data is collected

When collected:	On all plots where P2 vegetation is being sampled (P2 VEGETATION SAMPLING STATUS = 1 or 2)
Field width:	1 digit
Tolerances:	At least 99 percent of the time

Values:	Code	Definition
	1	Collect data for vegetation structure only; total aerial canopy cover and canopy cover by layer for tally tree species (all sizes), non-tally tree species (all sizes), shrubs/subshrubs/woody vines, forbs, and graminoids.
	2	Collect vegetation structure data (Level of Detail = 1) **plus** understory species composition data including up to four most abundant species per SPECIES GROWTH HABIT per subplot of: seedlings and saplings of any tree species (tally or non-tally) < 5 inches DBH (DRC for woodland species), non-tally tree species ≥ 5 inches DBH, shrubs/subshrubs/woody vines, forbs, and graminoids.
	3	Collect vegetation structure data, understory species composition data (Level of Detail = 2), **plus** up to four most abundant tree species (tally or non-tally) ≥ 5 inches DBH (DRC for woodland species) per SPECIES GROWTH HABIT per subplot.

Item 4.2.1.17 INVASIVE PLANT SAMPLING STATUS (CORE OPTIONAL 1.23)
[PLOT.INVASIVE_SAMPLING_STATUS_CD]

*This downloaded plot-level variable d*etermines whether invasive plant data *(see Invasive Plants, Chapter 13, pg.269)* will be recorded on the plot and the land class(es) on which it will be recorded. Invasive plant data is not collected on any plots on Oregon, Washington, or California.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	Not collecting invasive plant data
	1	Invasive plant data collected only on accessible forest land conditions *(CONDITION CLASS STATUS = 1 and NONFOREST SAMPLING STATUS = 0)*
	2	Invasive plant data collected on all *measured* land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)

Item 4.2.1.18 INVASIVE PLANT SPECIMEN COLLECTION RULE (CORE OPTIONAL 1.23)
[PLOT.INVASIVE_SPECIMEN_RULE_CD]

Downloaded code to indicate if collection of specimens of unknown *(or suspected)* invasive species is required. While not required in PFSL, unknown specimens can be collected for later identification when a suspected invasive is encountered.

When collected:	Downloaded on all plots where INVASIVE PLANT DATA SAMPLING STATUS = 1 or 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Value	Description
	0	FIA unit does not require specimen collection for invasive plants
	1	FIA unit requires specimen collection for invasive plants

Item 4.2.1.19 DWM SAMPLING STATUS (BASE 1.25.1)
[PLOT.P2DWM_SAMPLING_STATUS_CD]

This downloaded code describes whether DWM data will be recorded and which variables will be recorded. If code = 0, no further data collection is required within this manual section. In California, Oregon, and Washington, BASE biomass DWM variables are measured on all accessible forest land and accessible, measurable nonforest conditions (DWM SAMPLING STATUS = 1).

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Value	Description
	0	Not sampling DWM
	1	BASE biomass DWM variables collected on measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2).
	2	BASE biomass and wildlife/ecological package DWM variables collected on measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2). **Required for P3 DWM**
	3	Rapid assessment DWM variables collected on measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2).

Item 4.2.1.20 SURVEY GRADE GPS SUBPLOT ROVER FILES REQUIRED (PNW)
[PLOT.GPS_REQUIRED_STATUS_CD_PNWRS]

Downloaded code identifying whether acceptable previous Survey Grade GPS Coordinates exist for this plot and whether new Survey Grade GPS Coordinates are required at this visit.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	0	Previous Survey Grade GPS Coordinates are acceptable. Plot does not require Survey Grade GPS Coordinates at this visit.
	1	Previous Survey Grade GPS Coordinates are not acceptable or were not collected. Plot requires Survey Grade GPS Coordinates at this visit.

Item 4.2.1.21 SPECIAL STUDY AREA (PFSL)
[PLOT. SPEC_STDY_CD_PNWRS]

A downloaded value indicating (1) the BLM Resource Area for plots that falls within the Western Oregon BLM timberlands inventory area or (2) that the plot is a CalFire plot. For conditions with OWNER CLASS = 22 that fall within the Western Oregon BLM timberlands inventory area, additional protocol including accessible, measurable nonforest conditions will be sampled. Indicator species will also be recorded (Subsection A.3.1 Region 6 (R6) and Western Oregon BLM Plant Indicator Lists).

For CalFire plots, ownership data collection is enabled in MIDAS Mobile under the Owner screen.

When Collected:	All Plots within the Western Oregon BLM timberlands inventory area			
Field Width:	20 characters			
Tolerance:	No errors			
Values:	Special Study Area Code	Special Study Area Name	Plant Indicator List	BLM District Name
	ORC03	Umpqua Resource Area	NW Oregon	Coos Bay District
	ORC04	Myrtlewood Resource Area	SW Oregon	Coos Bay District
	ORL04W	Klamath Resource Area	Central Oregon	Lakeview District
	ORM05	Butte Falls Resource Area	SW Oregon	Medford District
	ORM06	Ashland Resource Area	SW Oregon	Medford District
	ORM07	Grants Pass Resource Area	SW Oregon	Medford District
	ORN01	Cascades Resource Area	NW Oregon	Northwest Oregon District
	ORN02	Mary's Peak Resource Area	NW Oregon	Northwest Oregon District
	ORN03	Siuslaw Resource Area	NW Oregon	Northwest Oregon District
	ORN04	Tillamook Resource Area	NW Oregon	Northwest Oregon District

	ORN05	Upper Willamette Resource Area	NW Oregon	Northwest Oregon District
	ORR04	Swiftwater Resource Area	SW Oregon	Roseburg District
	ORR05	South River Resource Area	SW Oregon	Roseburg District
	CALFIRE	CalFire contract plot		

Item 4.2.1.22 URBAN AREA (PNW)

This downloaded code identifies if the plot lies in an urban area.

When collected:	Downloaded for all plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	0	No, plot does not fall in an urban area
	1	Yes, plot does fall in an urban area

Item 4.2.1.23 NATIONAL FOREST REGION (PFSL, AFSL)

This downloaded code identifies which National Forest System Region the plot lies in. Some tree species are excluded from collection in specific regions, as designated in the National Forest System (NFS) exclusion list in Item 8.5.1.12, SPECIES (CORE 5.8).

When collected:	Downloaded for all plots
Field width:	2 digits
Tolerance:	No errors
Values:	1, 4, 5 and 6

Item 4.2.1.24 YEAR OF PREVIOUS INVENTORY (PNW)
[PLOT.PREV_INV_YEAR_PNWRS]

This code is downloaded if the plot was visited previously. It indicates the year of the previous annual inventory. Do not change the downloaded date.

When collected:	Downloaded if plot was visited previously
Field width:	4 digits
Tolerance:	No errors
Values:	Year

Item 4.2.1.25 MONTH OF PREVIOUS INVENTORY (PNW)
[PLOT.PREV_INV_MONTH_PNWRS]

This code is downloaded if the plot was visited previously. It indicates the month of the previous annual inventory. Do not change the downloaded date.

When collected:	Downloaded if plot was visited previously
Field width:	2 digits
Tolerance:	No errors
Values:	Month (1 to 12)

Item 4.2.1.26 PREVIOUS GROUND LAND CLASS (PFSL)
[PLOT.PREV_GLC_PNWRS]

This code identifies the ground land class at the previous inventory. Do not change the downloaded code.

When collected:	Downloaded for plots that were classified within inventoried area at the previous inventory
Field width:	2 digits
Tolerance:	No errors
Values:	See Appendix L, Historical Inventory Information, for PREVIOUS GROUND LAND CLASS codes and their definitions

Item 4.2.1.27 PHASE (PFSL)
[PLOT.PHASE_PNWRS]

This downloaded code identifies the phase used to determine what data is collected on a plot. Phase 2 plots follow the standard field guide, while Phase 3 plots include additional P3 indicators.

When collected:	Downloaded for all plots
Field width:	2 alphanumeric characters
Tolerance:	No errors
Values:	P2 (Phase 2) or P3 (Phase 2 and Phase 3)

SUBSECTION 4.2.2 SPECIAL STUDIES

Item 4.2.2.1 FIRE PLOT (AFSL, PFSL)
[PLOT.FIRE_PLOT_PNWRS]

This is a downloaded code identifying if plot has been selected as a Fire Effects and Recovery Study (FERS) plot. Protocol can be found in the Fire Effects and Recovery Study manual supplement.

When collected:	All plots	
Field width:	1 character	
Tolerance:	n/a	
Values:	Code	Definition
	Y	Plot has been selected as a FERS plot
	N	Plot is not a FERS plot

SECTION 4.3 PLOT LEVEL DATA COLLECTED IN THE FIELD

SUBSECTION 4.3.1 CREW VISIT INFORMATION

Item 4.3.1.1 SAMPLE METHOD CODE (PNW)
[PLOT.DATA_SOURCE_PNWRS]

Record the code that describes the source for the data collected on the plot location.

When collected:	All plots			
Field width:	1 digit			
Tolerance:	No errors			
Values:	Code	Sample Method	Description	Core codes (office use only)
	1	Ground	All data collected from a ground visit by a field crew.	1
	2	Viewed from a distance	Location was flown over or viewed from a distance (e.g., viewed from a road or adjacent ridgeline).	1
	3	Photo Interpretation	Information for the location was determined using photo interpretation.	2
	4	Other─specify	Specify source of data in PLOT NOTES.	2

Item 4.3.1.2 QA STATUS (CORE 1.17)
[PLOT.QA_STATUS]

Electronic data files are automatically named by the data recorder using the PLOT NUMBER and File Name Code. Electronic data files for plots with QA STATUS 2 through 6 are saved as separate files so that the original standard production plot data is preserved and can be used for quality control and statistical analysis.

<u>Record the code to indicate the type of plot data collected, using the following codes.</u>

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Standard production plot
	2	Cold check
	3	Reference plot (off grid)
	4	Training/practice plot (off grid)
	5	Botched plot file (disregard during data processing)
	6	Blind check
	7	Hot check (production plot)

Item 4.3.1.3 CREW TYPE (AFSL, PFSL)
[PLOT.CREW_TYPE_PNWRS]

Record the code to specify what type of crew is measuring the plot.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Crew Type
	1	Standard Forest Service field crew
	2	QA crew (any QA crew member present collecting data, regardless of plot QA Status)
	3	Standard Contractor field crew

Item 4.3.1.4 CREW NUMBER (CORE 1.18)
[PLOT.CREWNBR1, CREWNBR2, CREWNBR3, CREWNBR4, CREWNBR5]

Record up to *five* crew numbers as assigned to *individual* field crew *members*; always record the crew leader first. The first 2 digits are for the responsible unit's station number (NRS – 24XXXX, SRS – 33XXXX, RMRS – 22XXXX, and PNW – 26XXXX).

When collected:	All plots	
Field Width:	6 digits	
Tolerance:	No errors	
Values:	Code	Definition
	PNW	260001 - 269999

SUBSECTION 4.3.2 CURRENT DATE OF INVENTORY

Item 4.3.2.1 YEAR (CORE 1.13.1)
[PLOT.MEASYEAR]

Record the year in which the plot was completed.

When collected:	All plots
Field width:	4 digits
Tolerance:	No errors
Values:	≥ 2023

Item 4.3.2.2 MONTH (CORE 1.13.2)
[PLOT.MEASMON]

Record the month in which the plot was completed.

When collected:	All plots							
Field width:	2 digits							
Tolerance:	No errors							
Values:	Month	Code		Month	Code		Month	Code
	January	1		May	5		September	9
	February	2		June	6		October	10
	March	3		July	7		November	11
	April	4		August	8		December	12

Item 4.3.2.3 DAY (CORE 1.13.3)
[PLOT.MEASDAY]

Record the day of the month on which the plot was completed.

When collected:	All plots
Field width:	2 digits
Tolerance:	No errors
Values:	1 to 31

SUBSECTION 4.3.3 TIME SPENT ON PLOT

Basic information about time spent collecting plot data is needed. The time it takes to measure plots will help determine possible cost and time savings of changes or deletions to data collected, or cost and time expenditures of proposed new items. The following data items are recorded when a plot is field visited (SAMPLE METHOD CODE = 1).

Item 4.3.3.1 TRAVEL TIME TO PLOT (PNW)
[PLOT.TIME_TO_PLOT_PNWRS]

Record the number of hours it took for the crew to reach and find the plot. Include time spent driving, flying, getting keys from landowners, changing flat tires, hiking, searching for the plot location, etc. This should include the time driving from the previous night's lodging and hiking to the plot. If multiple days were required to reach the plot, include travel time from all days. If additional plots are measured from a single campsite, use travel time from the campsite for the additional plots. If time differs among crew members, use the crew leader's travel time. If the plot was visited on subsequent days, only use travel time to reach the plot on the initial visit. Estimate travel time to the nearest half hour.

When collected:	When SAMPLE METHOD CODE = 1
Field width:	3 digits (xx.y)
Tolerance:	1 hour
Values:	00.0 to 99.5

Item 4.3.3.2 MEASUREMENT TIME ON PLOT (PNW)
[PLOT.TIME_ON_PLOT_PNWRS]

Record the number of person-hours it took to measure all items on the plot (number of people on plot X number of hours on plot). If multiple days were required, add times for a total. Include all time on plot including breaks (if any), equipment repair, etc., as well as actual measurement time. Estimate measurement time on plot to the nearest half hour.

When collected:	When SAMPLE METHOD CODE = 1
Field width:	3 digits (xx.y)
Tolerance:	1 hour
Values:	00.0 to 99.5

Item 4.3.3.3 TRAVEL TIME FROM PLOT (PNW)
[PLOT.TIME_FROM_PLOT_PNWRS]

Record the number of hours you think it will take to travel back from the plot. Do not include time for anticipated stops or delays. Typically this will be from the plot to the lodging where you are staying. If multiple days are required to return, use total travel time anticipated. If additional plots have been measured from a single campsite, use only travel time to the campsite for the additional plots. Estimate travel time to the nearest half hour.

When collected:	When SAMPLE METHOD CODE = 1
Field width:	3 digits (xx.y)
Tolerance:	1 hour
Values:	00.0 to 99.5

SUBSECTION 4.3.4 PLOT LEVEL FUNDAMENTALS

Item 4.3.4.1 PLOT STATUS (CORE 1.4)
[PLOT.PLOT_STATUS_CD]

Record the code describing the sampling status of the plot. In cases where a plot is inaccessible, but obviously contains no forest land, record PLOT STATUS = 2. In cases where a plot is access-denied or hazardous land use, and has the possibility of forest, record PLOT STATUS = 3.

All skipped plots that will be carried over to the following year will be coded as PLOT STATUS = 3, regardless of whether or not a forested condition exists or potentially exists. Skipped plots that are certain to not have a forested condition, have a measurable nonforest condition (NONFOREST SAMPLING STATUS = 1), and have been on the list of field plots for three years should be coded as PLOT STATUS = 2.

If a plot contains nonforest and nonsampled conditions, code PLOT STATUS = 3. Use procedures described under Subsection 5.2.2 for when to map between nonforest and nonsampled conditions.

Note for off-grid plots outside of Forest Service administered land and off-grid plots outside of BLM land within the Western Oregon BLM timberlands inventory area and off-grid plots outside of Oregon Department of Forestry: When all subplot centers are found to be outside of Forest Service administered lands or outside of BLM land within the Western Oregon BLM timberlands inventory area, or outside ODF lands, Item 4.3.4.1, PLOT STATUS (CORE 1.4) shall be recorded 3, Nonsampled - possibility of forest land, and Item 4.3.4.2, PLOT NONSAMPLED REASON (CORE 1.7) shall be recorded 10, Other, with the electronic PLOT NOTE: “DROP OFF-GRID PLOT: NOT ON NFS LANDS”.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Sampled – at least one accessible forest land condition present on plot
	2	Sampled – no accessible forest land condition present on plot
	3	Nonsampled – possibility of forest land

Item 4.3.4.2 PLOT NONSAMPLED REASON (CORE 1.7)
[PLOT.PLOT_NONSAMPLE_REASN_CD]

For entire plots that cannot be sampled, record one of the following reasons.

When collected:	When PLOT STATUS = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	01	Outside U.S. boundary – Entire plot is outside of the U.S. border.
	02	Denied access – Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot. Because a denied-access plot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available. *There are no minimum size or width requirements for a condition class delineated by denied access.*
	03	Hazardous – Entire plot cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc. Although most hazards will not change over time, a hazardous plot remains in the sample and is re-examined at the next occasion to determine if the hazard is still present. *There are no minimum size or width requirements for a condition class delineated by a hazardous condition.*
	06	Lost plot – Entire plot cannot be found.Whenever this code is assigned, a replacement plot is required. The plot that is lost is assigned SAMPLE KIND = 2 and NONSAMPLED REASON = 6. The replacement plot is assigned SAMPLE KIND = 3.
	08	Skipped visit – Entire plot skipped. Used for plots that are not completed prior to the time a panel is finished and submitted for processing.

	10	Other – Entire plot not sampled due to a reason other than one of the specific reasons already listed. An *electronic PLOT NOTE* is required to describe the situation.

Item 4.3.4.3 NONFOREST SAMPLING STATUS (CORE 1.5)
[PLOT.NF_SAMPLING_STATUS_CD]

An auto-populated code that indicates whether this plot is part of a nonforest inventory. MIDAS will set NONFOREST SAMPLING STATUS = 1 when at least one nonforest land condition class present on plot qualifies as measurable nonforest (NONFOREST CONDITION CLASS SAMPLING STATUS = 1). Certain data items are recorded in NONFOREST SAMPLING STATUS = 1 conditions which are not typically measured in nonforest conditions; these are identified in the associated "when collected" field for individual data items.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	No nonforest land condition classes meeting criteria for measurement present on the plot
	1	At least one nonforest land condition class meeting criteria for measurement present on the plot (regardless of accessibility)

Item 4.3.4.4 NONFOREST PLOT STATUS (CORE 1.6)
[PLOT.NF_PLOT_STATUS_CD]

Auto-populated code that describes the plot status of the nonforest plot, i.e., PLOT STATUS = 2.

When collected:	When PLOT STATUS = 2 and NONFOREST SAMPLING STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Sampled - at least one accessible*, measured* nonforest land condition present on the plot
	3	Nonsampled nonforest*. None of the measurable nonforest land condition classes present on plot are accessible.*

Item 4.3.4.5 NONFOREST PLOT NONSAMPLED REASON (CORE 1.8)
[PLOT.NF_PLOT_NONSAMPLE_REASON_CD]

For entire nonforest plots that cannot be sampled, record one of the following reasons.

When collected:	When NONFOREST PLOT STATUS = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	02	Denied access - Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot. Because a denied-access plot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
	03	Hazardous - Entire plot cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc. Although most hazards will not change over time, a hazardous plot remains in the sample and is re-examined at the next occasion to determine if the hazard is still present.
	08	Skipped visit - Entire plot skipped. Used for plots that *have been on the list of field plots for three years and are not completed; the plot is skipped for an entire inventory cycle.*
	10	Other - Entire plot not sampled due to a reason other than one of the specific reasons already listed. An *electronic PLOT NOTE* is required to describe the situation.

Item 4.3.4.6 SUBPLOTS EXAMINED (CORE 1.9)
[PLOT.SUBP_EXAMINE_CD]

Record the number of subplots examined. By default, PLOT STATUS = 1 plots have all 4 subplots examined.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Only subplot 1 center condition examined and all other subplots assumed (inferred) to be the same *(remote sensing use and plots viewed from a distance)*
	4	All four subplots fully described (no assumptions/inferences) *(for field visited plots)*

Item 4.3.4.7 SAMPLE KIND (CORE 1.10)
[PLOT.KINDCD]

This is a downloaded code that describes the kind of plot being installed. Update if incorrect and contact the office (supervisor or data manager) immediately.

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Initial 4-subplot plot establishment - the initial establishment and sampling of a national design plot (FIA Field Guide versions 1.1 and higher). SAMPLE KIND 1 is assigned under the following circumstances: ▪ Initial activation of a panel or subpanel ▪ Reactivation of a panel or subpanel that was previously dropped ▪ Resampling of established plots that were not sampled at the previous visit.
	2	Remeasurement – remeasurement of a national design plot that was sampled at the previous *[annual]* inventory.
	3	Replacement plot – a replacement plot for a previously established *annual inventory* plot. *All attempts to locate the plot have failed. Crew collects all data as if this were a new plot.* Assign SAMPLE KIND = 3 if a plot is re-installed at a location other than the original location (i.e., plots that have been lost, moved, or otherwise replaced). Note that replacement plots require a separate plot file for the replaced plot. *Replaced (lost) plots are assigned PLOT STATUS = 3, PLOT NONSAMPLED REASON CODE = 6, and SAMPLE KIND = 2. Lost plots retain the original plot number. For the replacement (new) plot, open a new file in the PDR with a plot number generated by MIDAS (or 99999 until the replacement plot number can be generated); assign PLOT STATUS = 1 or 2, SAMPLE KIND = 3, and tie it to the replaced plot by entering the PREVIOUS PLOT NUMBER.*

Sample Kind Assignment Matrix

	Time X	**Time X+1**
PLOT STATUS	1 or 2	1, 2 or 3
SAMPLE KIND	1	2
PLOT STATUS	3	1, 2 or 3
SAMPLE KIND	1	1
PLOT STATUS	3	1, 2 or 3
SAMPLE KIND	2	1

* Time X and Time X+1 refer to any two sequential, scheduled (on-panel) inventories.

Initial Plot Establishment: For the purpose of assigning SAMPLE KIND, initial plot establishment is defined as the first scheduled on-panel sample, not the more literal interpretation of the first time a plot is installed on the ground. For example, a privately owned plot determined to be nonforest during the pre-field review at the first scheduled on-panel sample is coded SAMPLE KIND = 1. At the next on-panel sample, the plot is installed on the ground for the first time and is coded SAMPLE KIND = 2.

Special Situations

- Special Studies: Plots may be measured off-panel when selected for a special study. At the first scheduled on-panel sample these plots are coded as SAMPLE KIND = 1.
- Temporal Intensification of FIA grid plots on Forest Service administered lands in Region 5: Plots from multiple panels were measured as part of temporal intensification in R5. At the first scheduled on-panel sample these plots are coded as SAMPLE KIND = 1.
- Region 5 Intensified Grid Plots: These plots are not part of the regular FIA grid and are referred to as 'off-grid' plots. The first field visit is coded SAMPLE KIND = 1, and subsequent field visits are coded SAMPLE KIND = 2.
- Region 6 Intensified Grid Plots: These plots are not part of the regular FIA grid and are referred to as 'off-grid' plots. These plots use the same coding procedures as regular FIA grid plots because they are measured as part of the panel system.

What data is re-measured: For normally scheduled (on-panel) plots, data from the previous on-panel sample will be re-measured and reconciled, regardless of interim field visits due to special studies or temporal intensification. For off-panel field visited plots, the last field visit will be re-measured and reconciled, regardless if it was on or off-panel.

Item 4.3.4.8 PREVIOUS PLOT MAPPING OR CONDITION ERROR (PFSL, AFSL)
[PLOT.PREV_COND_MAP_ERROR_PNWRS]

Record a code to indicate whether or not a correctable previous mapping error exists on the plot (any of the four subplots/macroplots), or if there are errors in any of the previous correctable condition class data items (PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP). PREVIOUS PLOT MAPPING OR CONDITION ERROR = Y if any previous errors exist. See Section 5.6 Condition Remeasurement for further instruction on determining previous errors.

When collected:	When CHANGE MATRIX REQUIRED = Y and PREVIOUS DATA CORRECTABLE = Y	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	N	No error in previous correctable plot mapping or condition class data items
	Y	Error in previous correctable plot mapping or condition class data items

Item 4.3.4.9 PREVIOUS PLOT NUMBER (CORE 1.11)
[PLOT.REPLACED_PLOT_NBR]

<u>Record the identification number for the plot that is being replaced.</u>

When collected:	When SAMPLE KIND = 3
Field width:	5 digits
Tolerance:	No errors
Values:	00001 to 99999

SUBSECTION 4.3.5 ADDITIONAL ITEMS

Item 4.3.5.1 TOPOGRAPHIC POSITION (PNW)
[PLOT.TOPO_POSITION_PNW]

Record or update the 1-digit code for the TOPOGRAPHIC POSITION that best describes the plot area. Use the common shape of slope listed in the table below as a guide. Record the code that best fits the TOPOGRAPHIC POSITION (Figure 4.1). On remeasurement plots (SAMPLE KIND = 2), this code should only be updated if there is a physical change or an obvious error by the previous crew. A related PLOT NOTE is required whenever this value is changed.

If the plot straddles a canyon bottom or is on a narrow ridge top, but most of the area lies on one side hill, record the topographic position of the side hill.

When collected:	All plots with at least one measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)		
Field width:	1 digit		
Tolerance:	One class for codes 3, 4, and 5. No errors for other codes.		
Values:	Code	Topographic Position	Common shape of slope
	1	Ridge top or mountain peak over 130 feet	Flat
	2	Narrow ridge top or peak less than 130 feet wide	Convex
	3	Side hill — upper 1/3	Convex
	4	Side hill — middle 1/3	No rounding
	5	Side hill — lower 1/3	Concave
	6	Canyon bottom less than 660 feet wide	Concave
	7	Bench, terrace or dry flat	Flat
	8	Broad alluvial flat over 660 feet wide	Flat
	9	Swamp or wet flat	Flat

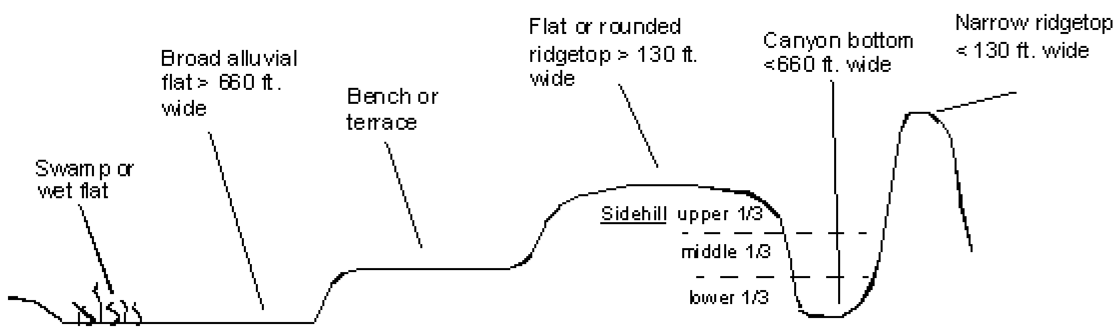


Figure 4.1: Illustration of TOPOGRAPHIC POSITION codes

Item 4.3.5.2 HORIZONTAL DISTANCE TO IMPROVED ROAD (CORE 1.15) [PLOT.RDDISTCD]

Record the straight-line distance from plot center (subplot 1) to the nearest improved road. An improved road is a road of any width that is maintained as evidenced by pavement, gravel, grading, ditching, and/or other improvements. To qualify, a road must be currently maintained at the time of measurement, regardless of future intentions for maintenance. Straight-line distance should be measured regardless of potential barriers such as landforms, icefields, waterways, or developments.

When collected:	*All plots with at least one measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	100 feet or less
	2	101 to 300 feet
	3	301 to 500 feet
	4	501 to 1000 feet
	5	1001 feet to 1/2 mile
	6	1/2 to 1 mile
	7	1 to 3 miles
	8	3 to 5 miles
	9	Greater than 5 miles

Item 4.3.5.3 WATER ON PLOT (CORE 1.16)
[PLOT.WATERCD]

Record the water source that has the greatest impact on the area within the accessible forest/nonforest land portion of any of the four *24-foot radius* subplots. The coding hierarchy is listed in order from large permanent water to temporary water. This variable can be used for recreation, wildlife, hydrology, and timber availability studies.

When collected:	*All plots with at least one measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	0	None – no water sources within the accessible forest/nonforest land
	1	Permanent streams or ponds too small to qualify as noncensus water
	2	Permanent water in the form of deep swamps, bogs, marshes without standing trees present and less than 1.0 ac*re* in size, or with standing trees
	3	Ditch/canal – human-made channels used as a means of moving water, such as irrigation or drainage which are too small to qualify as noncensus water
	4	Temporary streams
	5	Flood zones – evidence of flooding when bodies of water exceed their natural banks
	9	Other temporary water – specify in PLOT NOTES

Item 4.3.5.4 SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED (PNW)
[PLOT.GPS_SAMPLING_STATUS_CD_PNWRS]

Code identifying whether Survey Grade GPS rover files were collected at this visit.

When collected:	When Survey Grade GPS Rover Files Required = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	0	No, Survey Grade GPS Coordinates were not collected at this visit
	1	Yes, Survey Grade GPS Coordinates were collected at this visit

Item 4.3.5.5 PLOT NOTES (CORE 1.21)
[PLOT.NOTES]

Use these fields to record notes pertaining to the entire plot. If the notes apply only to a specific subplot or other specific aspect of the plot, then make that clear in the notes.

When collected:	All plots
Field width:	*2000* characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

SUBSECTION 4.3.6 SUDDEN OAK DEATH SAMPLE COLLECTION

Any time Sudden Oak Death is suspected on or in the vicinity of the plot area, and leaf spots on known hosts are observed, a SOD leaf spot sample is required if collectable, where collectable is defined as leaves with spots characteristic of *Phytophthora ramorum* infection are present at a location that can be safely and legally (i.e., without trespassing) sampled. Vicinity of the plot area means up to 1 mile from plot center; however, crews are not expected to exhaustively search within this radius. Collection outside the 185 foot radius plot area is serendipitous in that it will only occur if crews happen to travel past it, observe it, and believe that leaf samples can be safely collected without violating landowner expectations (i.e., lands are believed to be owned by an owner who 1) also owns land within the plot footprint and 2) has provided permission for the plot visit, or 3) is a public or corporate owner that crews believe would not object to sample collection).

Refer to Appendix J, Sudden Oak Death Syndrome Assessment for symptom descriptions and sample collection instructions.

On-plot samples are collected within the 185 foot radius plot area, off-plot samples are collected beyond the 185 foot radius plot area. Up to one on-plot and one off-plot sample can be collect per plot.

Item 4.3.6.1 SOD SAMPLE COLLECTED (PFSL)
[PLOT.SOD_COLLECTED_PNWRS]

Record the code indicating if a SOD sample was collected. It is possible to collect both an on-plot and an off-plot sample for the same plot (they would be sent in with different PDR collection slips bearing different PDR collection slip numbers).

When collected:	All plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	Y	A sudden oak death sample was collected and submitted
	N	A sudden oak death sample was not collected

Item 4.3.6.2 SOD PEST DETECTION REPORT NUMBER (PFSL)
[SOD_PLOT_PNWRS.SOD_PDR_NBR]

Record the number on the Pest Detection Report completed for submission with a sample of foliage collected to assess presence of *Phythoptera ramorum*, the pathogen responsible for sudden oak death, when sudden oak death symptoms are apparent on the plot, or on the way to or from, and within one mile of the plot and foliage with leaf spots is obtainable. It is possible to record up to two PDR numbers, one for an on-plot sample, and one for an off-plot sample. The plot defined for this purpose is the 185 foot radius plot area.

When collected:	When SOD SAMPLE COLLECTED = Y
Field width:	6 digits
Tolerance:	No errors
Values:	000001-999999

Item 4.3.6.3 SOD DISTANCE (PFSL)
[SOD_PLOT_PNWRS.SOD_DIST_FT]

Record the horizontal distance, in feet, between the collection location point and plot center. The on-plot collection location should be selected as the point closest to plot center that contains SOD symptoms and foliage suitable for sampling.

When collected:	When SOD SAMPLE COLLECTED = Y
Field width:	4 digits
Tolerance:	on-plot +/- 20 feet
	off plot +/- 1000 feet
Values:	0001-5280

Item 4.3.6.4 SOD AZIMUTH (PFSL)
[SOD_PLOT_PNWRS.SOD_AZM]

Record the azimuth to the collection location point from plot center.

When collected:	When SOD SAMPLE COLLECTED = Y
Field width:	3 digits
Tolerance:	+/- 30 degrees
Values:	001-360

Item 4.3.6.5 SOD PRESENT (PFSL)
[SOD_PLOT_PNWRS.SOD_PRESENT_YN]

Populated by the QA Coordinator or their Level 3 or 4 designate, with outcome of lab analysis of collected leaf sample, post-field season.

When collected:	When SOD SAMPLE COLLECTED = Y	
Field width:	1 digit	
Values:	Code	Description
	Y	Sample tested positive for *Phythoptera ramorum* by the lab
	N	Sample tested negative for *Phythoptera ramorum* by the lab

Item 4.3.6.6 SOD CONDITION CLASS NUMBER (PFSL)
[SOD_PLOT_PNWRS.CONDID]

Record the condition class number for the condition from which the plot SOD sample was collected. If the sample is collected from multiple conditions, record the condition class representing the majority of the sample material. If an off-plot sample is collected on a condition that is present on the plot, then record that condition class number, regardless of the distance. If the condition is different from any recorded on the plot, then a condition of zero should be recorded.

When collected:	When SOD SAMPLE COLLECTED = Y
Field width:	1 digit
Tolerance:	No errors
Values:	0-9

SUBSECTION 4.3.7 REFERENCE POINT ATTRIBUTES

Record the following items which describe the reference point (RP) and the course from the RP to the plot as described in the Subsection 3.3.1, The Reference Point.

Note: All ground visited plots (SAMPLE METHOD CODE = 1) require an RP and two witness trees/objects (see Subsection 3.3.2, Witness Trees/Objects).

RP must be field visited and updated when SAMPLE METHOD CODE = 1 and PLOT STATUS = 2 or SAMPLE KIND = 1, otherwise the RP can be re-visited at the crew's discretion. If the RP is not visited at the current cycle, use RP TYPE = 0.

Item 4.3.7.1 RP TYPE (PNW)
[PLOT.RP_TYPE_PNWRS]

Record the type of object chosen as the reference point (RP).

When collected:	When SAMPLE METHOD CODE = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	RP Type
	1	Tree or stump
	2	Rock
	3	Shrub
	4	Other – specify in RP NOTES
	0	RP not visited at current inventory

Item 4.3.7.2 RP SPECIES (PNW)
[PLOT.RP_SPCD_PNWRS]

If the RP is a tree or stump record the species code.

When collected:	When RP TYPE = 1
Field width:	4 digits
Tolerance:	No errors
Values:	See APPENDIX D FIA Tree Species Codes

Item 4.3.7.3 RP DIAMETER (PNW)
[PLOT.RP_DIA_PNWRS]

If the RP is a tree or a stump, measure and record the DBH/DRC to the **nearest inch** (see Section 8.6, Diameter).

When collected:	When RP TYPE = 1
Field width:	3 digits
Tolerance:	+/- 10 percent
Values:	001 to 999 to the nearest inch

Item 4.3.7.4 RP AZIMUTH (PNW)
[PLOT.RP_AZIMUTH_PNWRS]

Record, in degrees, the azimuth from the RP to the plot center. When azimuth is determined using a GPS, include this information in the electronic RP NOTES.

When collected:	When SAMPLE METHOD CODE = 1 and RP TYPE > 0
Field width:	3 digits
Tolerance:	+/- 4 degrees
Values:	001 to 360

Item 4.3.7.5 RP HORIZONTAL DISTANCE (PNW)
[PLOT.RP_DIST_PNWRS]

Record, to the nearest foot, the **horizontal** distance from the RP to the plot center; an RP should be within 5000 feet of plot center. When horizontal distance is collected using a GPS, include this information in the electronic RP NOTES.

When collected:	When SAMPLE METHOD CODE = 1 and RP TYPE > 0
Field width:	4 digits
Tolerance:	+/- 5 percent
Values:	0000 to 5000 feet

Item 4.3.7.6 RP AZIMUTH/DISTANCE TO SUBPLOT NUMBER (PNW)
[PLOT.RP_SUBP_PNWRS]

Record the 1-digit number of the subplot which is referenced from the RP. Always reference to subplot 1 unless it is inaccessible (e.g., hazardous, denied access, census/noncensus water). If subplot 1 center is inaccessible, the PC stake should be installed at the lowest numbered subplot that is accessible.

When collected:	When SAMPLE METHOD CODE = 1 and RP TYPE > 0
Field width:	1 digit
Tolerance;	No errors
Values:	1 to 4

Item 4.3.7.7 RP NOTES (PNW)
[PLOT.RP_NOTES_PNWRS]

Record notes to explain any special RP situation that may need clarification for future plot visits (e.g., shrub species, height/size of rock, reason RP not visited (only necessary when SAMPLE METHOD CODE = 1 and PLOT STATUS =2 or SAMPLE KIND = 1), RP AZIMUTH and RP HORIZONTAL DISTANCE collected with a GPS, etc.). Required if RP TYPE = 4 (other).

When collected:	When SAMPLE METHOD CODE = 1: as needed to describe a special situation with the plot RP; required when RP TYPE = 4
Field width:	2000 characters
Tolerance:	N/A
Value:	Single words or abbreviated sentences

SUBSECTION 4.3.8 PLOT DESCRIPTION

Item 4.3.8.1 PLOT ACCESS DESCRIPTION (PNW)
[PLOT.DIRECTIONS_TO_PLOT]

Record a description of the route used to access a plot. Directions should be written so they are easy to read and understand, and include information that will aid future crews in relocating the plot. If a plot is only viewed from a distance record the route to the viewing location.

Directions should include the following:

1. Starting Point: Select a permanent feature easily identifiable on a map and on the ground. This starting location must be referenced to a minimum of two county highways using names or numbers found on the ground. If maps have different road names this must be noted as well. In some cases (e.g. wilderness areas) the starting point may be a trailhead or the end of a local road. Make sure to include the trail name and number. The starting point for plots accessed by helicopter should be the LZ.
2. Reference the starting point to the nearest town including direction and approximate mileage from the town (e.g. '10 miles north of Portland', '~half mile southwest of Salem'). Plots accessed by helicopter can reference the airport, hub, or Anchorage from which the crew flew.
3. Identify the mode of travel (e.g. driving, hiking, helicopter).
4. Include the distance traveled between road or trail segments.
5. Give the direction of travel when turning onto a road or trail (e.g. 'turn left [west] onto Forest Lane and proceed 1.5 miles'). It is helpful to use the compass direction reference in case the plot is approached from a different direction. If you include this, use parentheses following wording such as a left, right or straight.
6. Note all gates or other pertinent information that may aid future crews in re-locating the plot (e.g. 'there is an old road on the west [left] with a locked gate [contact DNR for combination]').
7. Describe any prominent features present in the plot area that are unlikely to change in the next ten years. Include details such as streams, rock outcrops, benches, man-made features, unusual or large trees, slope, aspect or topographic position.
8. Provide directions to a safe and convenient parking location. This information can prevent numerous turn-arounds on potentially hazardous roads. For a plot accessed by helicopter, details about the landing zone should be included that may help the next crew (e.g. 'shrubs were removed to widen safety circle prior to pickup').
9. Points of Departure (POD_optional): include POD location in reference to the ending distance. A POD is typically a tree or object and is used when foot travel becomes the primary means of accessing the RP, or when the travel route is long and complex. Use the same monumentation methods as the RP and include specific information from the POD to the RP in this description (Species, Diameter, Azimuth, and Horizontal Distance to RP). In Alaska, a POD is never monumented, but the crew may choose to collect a mid-route GPS coordinate if the crew found a particularly good hiking route to reach plot center. Include the coordinate in Section 4.4, GPS Coordinates, GPS Location Type = 7 'Other.'
10. Include the RP location in reference to the ending distance or POD (e.g. 'the RP is a forked Douglas-fir in a draw ~10 feet east [right] of FS Road 32').
11. If RP is not required or not visited at the current inventory then provide directions from the parking location or landing zone to PC including horizontal distance and azimuth to plot. For long trail access or road hikes include distance and azimuth from where you leave the trail or road.
12. Plots viewed from a distance: provide azimuth and horizontal distance to plot center from the viewing location.

When collected:	When Sample Method Code = 1 or 2
Field width:	2000 characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

Item 4.3.8.2 PLOT NARRATIVE (PNW)
[PLOT.PLOT_NARRATIVE]

Record a description of the plot as well as relevant information to land owners, analysts, crews and QA inspectors. Analysts use it to provide an explanation for any major changes that have occurred since the previous inventory, especially those related to condition class attributes, as well as any anomalies in the data. They also use historical information to better understand why the plot conditions are what they are today. Crews review previous summaries to determine the overall level of difficulty of a plot, anticipate access problems, and explain any oddities about previously collected data. QA inspectors review summaries as part of overall plot quality.

The plot summary should observe the following guidelines:

- Describe species, stand structure, damages, etc. with words rather than using corresponding data item codes.
- Exclude unprofessional comments. Plot summaries are public information available to anyone using the data. They are also provided to landowners.
- Transfer relevant information written on the outside of the plot jacket.
- Do not record location coordinates here. Record them in Section 4.4, GPS Coordinates.

Provide documentation for the following information in the order listed under each category.

Accessible Forest Land

1. Condition Class - describe each condition class present on plot
   - Include the following: dominant tree species; stand age; stand size; physiographic information; regeneration species including relative abundance; present and past treatments; present and past disturbances from insects, disease, weather, environment and human; and understory species of shrubs, forbs and graminoids using NRCS species codes, English, or Latin names.
   - Describe any changes to CONDITION CLASS STATUS since the previous visit. This can be due to real, physical change on the ground or from previous crew error. When it is from physical change give details as to what caused the change (e.g. 'at the previous inventory plot was nonforest rangeland but now trees are regenerating and the condition has 10 percent canopy cover' or 'at the previous inventory plot was accessible forest land but was cleared for development in 2013'). If due to previous crew error state what was in error and why it is considered an error (e.g. 'previous crew erroneously mapped a meadow as nonforest land but the area did not meet the size requirements to be considered a separate condition').
   - Pertinent information or plot anomalies - describe information pertinent to the plot including things that might not be represented in the data (e.g. 'subplot 3 has a higher tree tally because of a dense thicket of Douglas-fir lining a seasonal stream' or 'root disease was coded as the previous inventory but there is currently no evidence of it' or 'Pacific dogwood and Pacific Yew are present in the condition but did not end up in the tree tally or vegetation profile').
2. Reserved status changes - If the reserved status has changed since the previous inventory visit note why (e.g. 'plot is in a new designated wilderness area as of 2014').
3. Ownership changes - If the owner has changed since the previous inventory visit, note why (e.g. land swap, a park bought the land, last occasion had the wrong owner, etc.)
4. Inability to install any portion of the plot - These are typically human or environmental related and require an explanation as to why it was not installed.
5. Any deviation from prescribed monumentation - If unable to use monumentation described in the manual, explain why and what the crew did to work around the issue (e.g. 'no squares, rounds, or DBH nails in trees per landowner's request', or 'microplot 2 center fell on a large, sloped rock slab with no way to stabilize the metal pin, instead used orange crayon to make a 2-inch wide circle with center dot showing where pin should have been').

Nonforest Land

Describe the NONFOREST LAND USE class. Include a list of the species present in the condition and any disturbances that may have occurred since a previous visit. This is especially important if the condition was accessible forest land and is now nonforest. Note whether this condition has the potential to become forested in the future. If the entire plot is nonforest state whether plot center is occupied or viewed from a distance. If plot was occupied and no stake was put in the ground, explain why.

Field Visited With Marginal Canopy Cover

Explain how the plot or condition did or did not meet the canopy cover requirement to meet the definition of forest land. If the subplot method was used to assess canopy cover and/or stocking describe the details including methodology for locating phantom subplots and the results.

Noncensus or Census Water

State that the plot/subplot center or the entire plot lands in either noncensus or census water, and provide a description of the body of water (e.g. Green Lake, Russian River, etc.). If the boundary of a noncensus or census water feature that occurs on or near a subplot is nebulous, describe the criteria used to define the boundary (e.g. presence/absence of woody vegetation, average high water mark).

Nonsampled - Access Denied and Hazardous

Describe why the condition is non-sampled. If the condition is access denied, state this and include a detailed description why if given one by the landowner. If the condition is hazardous give details as to how this was determined to be so. Document attempted routes, unsuccessful hazard abatement strategies (e.g. different timing, resources, and/or special access such as boat or helicopter) and the logic for making the hazardous determination. The hazard description (whether it applies to sole route to plot, entire plot, a subplot or a small condition on a plot) should be specific enough for any individual to clearly understand the hazard and to provide useful information for future crews.

Nonsampled - Skipped Visit

Provide a brief description of why the plot is being carried over to the next field season.

Special Studies

If the plot is being completed as part of a special study, identify the name of the study early in the narrative.

When collected:	All plots
Field width:	2000 characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

SECTION 4.4 GPS COORDINATES

Use a global positioning system (GPS) unit to determine the plot *center* coordinates and elevation of all plot locations, *including nonforest and nonsampled plot locations when SAMPLE METHOD CODE = 1,* even if GPS has been used to locate the plot in the past.

Additionally, when SURVEY GRADE GPS SUBPLOT ROVER FILES REQUIRED = 1, crews will also collect a 15 minute GPS rover file at each subplot center with more advanced survey grade GNSS (Global Navigation Satellite System) units that collect multiple-frequency (e.g., L1 and L2 code and carrier phase), multiple-constellation (e.g. GPS and GLONASS satellite) data. These rover files are post-processed in the office to obtain more accurate coordinates for each field subplot location.

Multiple records per plot may exist in the GPS screen; records are differentiated by GPS LOCATION TYPE (Item 4.4.3.6). Typically a set of coordinates will only be collected for the PC and subplots when required; additional GPS records (i.e., waypoints) may be recorded and should include a brief description in GPS NOTES (Item 4.4.3.14). Collecting coordinates at the RP and any installed points of departure (PODs) is at the field crews' discretion. Use GPS LOCATION TYPE = 2 for RP coordinates and GPS LOCATION TYPE = 7 for POD coordinates, with a GPS NOTE stating POD number.

SUBSECTION 4.4.1 SURVEY GRADE GPS SUBPLOT COORDINATES

Survey Grade GPS rover files should be collected at each subplot when SURVEY GRADE GPS SUBPLOT ROVER FILES REQUIRED = 1. SURVEY GRADE GPS SUBPLOT ROVER FILES REQUIRED will be downloaded with 1 when previous survey grade GPGPS coordinates are not acceptable or were not collected. SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED is used to indicate if coordinates were collected at the current visit. **Note: This is not a substitute for realtime GPS plot center coordinates collected with either the recreational grade handheld units or the survey grade unit.**

Operation instructions for using the Survey Grade GPS units can be found in APPENDIX P.

When to collect Survey Grade GPS rover files for each subplot:

1. When SURVEY GRADE GPS SUBPLOT ROVER FILES REQUIRED = 1 AND PLOT STATUS = 1 or 2, coordinates should be taken at all subplots that have an accessible forest land or measurable nonforest land condition class present on the subplot/macroplot (CONDITION CLASS STATUS 1 or NONFOREST CONDITION CLASS STATUS = 2).
2. When SURVEY GRADE GPS SUBPLOT ROVER FILES REQUIRED = 1 and a subplot is nonsampled, or has no accessible forestland or measurable nonforest on the subplot/macroplot, or if a subplot rover file is not collected for other reasons (e.g., safety, equipment failure), record GPS UNIT TYPE = 0 for the corresponding location (GPS LOCATION TYPE = 15, 16, 17, or 18) and record an explanation in GPS NOTES.

Survey Grade GPS coordinates should be taken with the unit placed directly over subplot center. Offsets are strongly discouraged for Survey Grade GPS coordinates and should only be used if there are conditions at subplot center preventing safe data collection (rock face, large boulder, etc) or if a GPS fix cannot be obtained with the unit at plot center. If an offset is necessary, measure the azimuth and distance from the offset location to the subplot center to the nearest tenth of a foot and record these data items as described in Item 4.4.4.1and Item 4.4.4.2.

SUBSECTION 4.4.2 REALTIME PLOT CENTER GPS COORDINATES

Collect at least 180 GPS readings at the plot center. These may be collected in a file for post-processing or averaged by the GPS unit. See Subsection P.2.2 for instructions for obtaining realtime position coordinates and elevation with the Trimble unit.

Soon after arriving at plot center, use the GPS unit to attempt to collect coordinates. If suitable positions cannot be obtained, try again before leaving the plot center.

If it is still not possible to get suitable coordinates from plot center, attempt to obtain them from a location within 200 feet of plot center. Obtain the azimuth and horizontal distance from the "offset" location to plot center. Record the azimuth and horizontal distance *to the plot center* as described in *Item 4.4.4.1 and Item 4.4.4.2.*

<u>Coordinates may be collected further than 200 feet away from the plot center if a laser measuring device is used to determine the horizontal distance from the "offset" location to plot center. Record the azimuth and horizontal distance *to plot center* as described in *Item 4.4.4.1 and Item 4.4.4.2*.</u>

If suitable coordinates cannot be collected at plot center because condition 1 is inaccessible (e.g. access denied or hazardous), then collect at least 180 GPS readings at the lowest numbered satellite subplot center that is accessible. Use GPS Location Type 4, 5, or 6 to identify the subplot where the GPS readings are collected.

SUBSECTION 4.4.3 GPS UNIT SETTINGS, DATUM, AND COORDINATE SYSTEM

<u>Consult the GPS unit operating manual or other regional instructions to ensure that the GPS unit internal settings, including datum and coordinate system, are correctly configured.</u>

Use the NAD83 (2011) datum and the UTM coordinate system. See Appendix P, GPS Operating Guide, for instructions on setting up and using the GPS units.

Item 4.4.3.1 GPS UNIT TYPE (CORE 1.19.3)
[GPS_PNWRS.GPS_TYPE]

<u>Record the kind of GPS unit used to collect coordinates. If suitable *realtime* coordinates cannot be obtained, record *"0"*.</u> Record "3" for Survey Grade GPS units. Record "2" for most standard handheld GPS units used for collecting realtime plot center coordinates. Record "4" when using Survey Grade units for collecting realtime plot center coordinates.

When collected:	When SAMPLE METHOD CODE = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	GPS coordinates not collected*, realtime plot center coordinates not collected for nonsampled plots (requires GPS NOTES)*
	2	Models capable of field-averaging
	3	Models capable of producing files that can be post-processed *(including HPGPS units when used for collecting subplot rover files)*
	4	Models not capable of field-averaging or post-processing *(including HPGPS units when used for collecting realtime plot center coordinates)*

Item 4.4.3.2 GPS SERIAL NUMBER (CORE 1.19.4)
[GPS_PNWRS.GPS_SERIAL_NBR]

<u>Record the last six digits of the serial number on the GPS unit used.</u> For Survey Grade GPS units, select the serial number from the drop down list in the data recorder.

When collected:	When GPS UNIT *TYPE* > 0
Field width:	6 digits
Tolerance:	No errors
Values:	000001 to 999999

Item 4.4.3.3 GPS ENTRY METHOD (CORE 1.19.5)
[GPS_PNWRS.GPS_ENTRY_METHOD_CD]

<u>Identify the method used to record GPS data</u>. This will be set to "0" for all units, including Survey Grade Units.

When Collected:	GPS UNIT *TYPE* > 0	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	GPS data manually entered
	1	GPS data electronically transferred

Item 4.4.3.4 GPS DATUM (CORE 1.19.6)
[GPS_PNWRS.GPS_DATUM]

This is an auto-generated code indicating the map datum that the GPS coordinates are collected in (i.e., the map datum selected on the GPS unit to display the coordinates).

When collected:	When GPS UNIT *TYPE = 2 or 4*	
Field width:	5 characters (cccnn)	
Tolerance:	No errors	
Values:	Code	Definition
	NAD83	North American Datum of 1983

Item 4.4.3.5 COORDINATE SYSTEM (CORE 1.19.7)
[GPS_PNWRS.GPS_COORD_SYS]

This is an auto-generated code indicating the type of coordinate system used to obtain readings.

When collected:	When GPS UNIT *TYPE = 2 or 4*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	2	UTM coordinate system

Item 4.4.3.6 GPS LOCATION TYPE (PNW)
[GPS_PNWRS.GPS_LOC_TYPE]

Record the location type for coordinates collected on the ground. Record codes 1 - 7 for realtime coordinates. Record codes 15 - 18 for the survey grade rover file collected on each subplot (four total records required when SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED = 1).

- When realtime plot center coordinates cannot be collected record the following GPS information (additional GPS data is not required):

  GPS UNIT TYPE = 0

  GPS LOCATION TYPE = 3

- When realtime coordinates are not collected at plot center, they must be collected at the lowest numbered subplot center that is accessible. In this situation, two GPS records are required; one for plot center and one for the satellite subplot where coordinates were actually collected.

  Enter the first record as the following:

  GPS UNIT TYPE = 0

  GPS LOCATION TYPE = 3

  Enter a second record with the GPS data collected at the other subplot center (GPS LOCATION TYPE = 4, 5 or 6). For the data items AZIMUTH TO PLOT CENTER and DISTANCE TO PLOT CENTER, record 000.

When collected:	All GPS records		
Field width:	2 digits		
Tolerance:	No errors		
Values:	Code	Type	Description
	1	LZ/TR	Landing zone / Truck parking spot
	2	RP	Reference point
	3	PC	Plot center (PC) (required)
	4	Subplot 2	Use only if PC not possible
	5	Subplot 3	Use only if PC not possible
	6	Subplot 4	Use only if PC not possible
	7	Other	Describe in GPS NOTES
	15	Subplot 1	Required when SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED = 1
	16	Subplot 2	Required when SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED = 1

	17	Subplot 3	Required when SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED = 1
	18	Subplot 4	Required when SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED = 1

Item 4.4.3.7 UTM ZONE (CORE 1.19.10)
[GPS_PNWRS.UTM_ZONE]

Record a 2-digit and 1 character field UTM ZONE as determined by GPS.

When collected:	When COORDINATE SYSTEM = 2 *and GPS UNIT TYPE = 2 or 4*
Field width:	3 digits
Tolerance:	When GPS ENTRY METHOD = 0, No errors in data entry When GPS ENTRY METHOD = 1, not applicable
Values:	*10, 11, and U, T, or S*

Item 4.4.3.8 EASTING (X) UTM (CORE 1.19.11)
[GPS_PNWRS.UTM_EASTING_X]

Record, *in meters*, the Easting coordinate as determined by GPS.

When collected:	When COORDINATE SYSTEM = 2 *and GPS UNIT TYPE = 2 or 4*
Field width:	7 digits
Tolerance:	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable
Values:	0000000 – 9999999

Item 4.4.3.9 NORTHING (Y) UTM (CORE 1.19.12)
[GPS_PNWRS.UTM_NORTHING_Y]

Record, *in meters*, the Northing coordinate as determined by GPS.

When collected:	When COORDINATE SYSTEM = 2 *and GPS UNIT TYPE = 2 or 4*
Field width:	7 digits
Tolerance:	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable
Values:	0000000 – 9999999

Item 4.4.3.10 GPS ELEVATION (CORE 1.19.16)
[GPS_PNWRS.GPS_ELEV]

Record the elevation above mean sea level, in feet, as determined by GPS.

When collected:	When GPS UNIT *TYPE* = 2 or 4
Field width:	6 digits (1st digit is + or -, last 5 digits are numeric)
Tolerance:	No errors
Values:	-00100 to +20000

Item 4.4.3.11 GPS ERROR (CORE 1.19.17)
[GPS_PNWRS.GPS_ERROR]

Record the error as shown on the GPS unit to the nearest foot, up to 999 feet. See Subsection P.2.2, Displaying Coordinates for Plot Center (optional) for instructions for obtaining realtime position precision with the Trimble unit.

When collected:	When GPS UNIT *TYPE* = 2 *or 4*
Field width:	3 digits
Tolerance:	No errors
Values:	000 – 999

Item 4.4.3.12 NUMBER OF READINGS (CORE 1.19.18)
[GPS_PNWRS.GPS_NBR_READINGS]

Record a 3-digit code indicating how many readings were averaged by the GPS unit to calculate the plot coordinates. Collect at least 180 readings if possible.

The PDR requires the number of averaged readings to be entered. Recreational GPS units used by PFSL do not have a number of readings counter, instead they utilize timers. The timer is displayed on the position screen. It displays in hours/minutes/and seconds. The GPS receiver collects one reading per second while averaging. To correctly enter the number of readings in the PDR, the time in minutes and seconds must be converted to number of readings. Since the unit collects 60 readings per minute of averaging crews must remember to multiply the number of minutes by 60 and then add the number of seconds shown to that figure. For example, if the Magellan receiver averages for three minutes and twelve seconds it will display 00:03:12. To convert this to number of readings multiply three minutes by sixty and add twelve (3 X 60 = 180 + 12 = 192). Crews would enter "192" for the NUMBER OF READINGS in the PDR.

When HPGPS units (GPS UNIT TYPE = 4) are used for realtime plot center coordinates, record 001.

When collected:	When GPS UNIT *TYPE* = 2 *or 4*
Field width:	3 digits
Tolerance:	No errors
Values:	001 to 999

Item 4.4.3.13 GPS FILENAME (CORE 1.19.19)
[GPS_PNWRS.FILENAME]

MIDAS will autofill the GPS filename when GPS UNIT TYPE = 3 and GPS LOCATION TYPE = 15-18.

When collected:	When GPS UNIT= 3 and GPS LOCATION TYPE = 15, 16, 17, 18
Field width:	*16 digits*
Tolerance:	No errors
Values:	*st-cty-plot%-sp# (e.g. ca-029-05247-sp1 where st is the 2 character state code, cty is the 3 digit county code (including any leading zeros), plot% is the 5 digit plot number (including any leading zeros), sp# is "sp" followed by the 1 digit subplot number 1-4)*

Item 4.4.3.14 GPS NOTES (PNW)
[GPS_PNWRS.NOTES]

Record any notes needed to clarify or explain a special situation in the particular GPS record being defined.

When collected:	As needed; required with GPS LOCATION TYPE = 7 or GPS UNIT TYPE = 0
Field width:	2000 characters
Tolerance:	N/A
Values:	Words and abbreviated sentences

SUBSECTION 4.4.4 CORRECTION FOR OFFSET LOCATION

As described in *Subsection 4.4.1 and* Subsection 4.4.2, coordinates may be collected at a location other than the plot *or subplot* center (an "offset" location)*(GPS LOCATION TYPE = 3, 15, 16, 17, or 18)*. If the GPS unit is capable of calculating plot center coordinates then AZIMUTH TO PLOT CENTER and DISTANCE TO PLOT CENTER both equal 000. Record the two data items below.

Item 4.4.4.1 AZIMUTH TO PLOT CENTER (CORE 1.19.14)
[GPS_PNWRS.GPS_AZM]

Record the azimuth from the location where coordinates were collected to actual plot *or subplot* center. If coordinates are collected at plot center or are corrected in the field to plot center, record 000. When realtime coordinates are not collected at plot center but are collected at another subplot center (GPS LOCATION TYPE = 4, 5 or 6), record 000.Offsets used to collect survey grade subplot rover files (GPS LOCATION TYPE = 15, 16, 17, or 18) are recorded in this data field.

When collected:	When GPS UNIT = 2, 3 or 4
Field width:	3 digits
Tolerance:	+/- 3 degrees
Values:	000 when coordinates **are** collected at plot/*subplot* center
	001 to 360 when coordinates **are not** collected at plot/*subplot* center

Item 4.4.4.2 DISTANCE TO PLOT CENTER (CORE 1.19.15)
[GPS_PNWRS.GPS_DIST]

Record the horizontal distance from the location where coordinates were collected to the actual plot *or subplot* center. If coordinates are collected at plot center or are corrected in the field to plot center, record 000. When realtime coordinates are not collected at plot center but are collected at another subplot center (GPS LOCATION TYPE = 4, 5 or 6), record 000. As described in *Subsection 4.4.2*, if a laser range finder is used to determine DISTANCE TO PLOT CENTER *for realtime plot center coordinates*, offset locations may be up to 999 feet from the plot center. If a range finder is not used, the offset location must be within 200 feet. Offsets are recorded in tenths of feet. Record to the nearest foot for realtime coordinates; to the nearest tenth of a foot for survey grade coordinates. Offsets used to collect survey grade subplot rover files (GPS LOCATION TYPE = 15, 16, 17 or 18) are recorded in this data field.

When collected:	When GPS UNIT = 2, 3 or 4
Field width:	*4* digits
Tolerance:	+/- 6 feet *for realtime coordinates, +/- 0.1 feet for survey grade GPS*
Values:	000.0 when coordinates **are** collected at plot/*subplot* center
	000.1 to 200.0 when a Laser range finder **is not** used to determine distance
	00.11 to 999.9 when a Laser range finder **is** used to determine distance

SUBSECTION 4.4.5 DOWNLOADED PLOT COORDINATES

For most plots, previous estimates of plot coordinates (pinprick location) will be available. These estimates come from several sources and will be of undocumented accuracy, but can be used as an aid in plot location. If available, the approximate plot coordinates will be downloaded to the data recorder and will be printed on the previous plot data sheets (see note below). They can be saved as a waypoint on the GPS unit and used to help locate the plot. Do not change any of the downloaded/printed plot coordinates codes.

Note: PFSL began using the NAD83 datum in 2010 (previous datum was NAD27). Plot coordinates printed on previous plot data printouts are in the previous datum; coordinates downloaded into the PDR have been converted to NAD83.

Item 4.4.5.1 PREVIOUS UTM ZONE (PFSL)
[PLOT.HIST_PREV_UTM_ZONE]

A 2-digit and 1 character field indicating in which UTM ZONE the plot is located.

When collected:	When COORDINATE SYSTEM = 2
Field width:	3 digits
Tolerance:	No errors
Values:	10, 11, and U, T, or S

Item 4.4.5.2 PREVIOUS EASTING (X) (PFSL)
[PLOT.HIST_PREV_UTM_EASTING_X]

This field indicates the Easting as determined from USGS maps, aerial photos, or a previous plot visit.

When collected:	When COORDINATE SYSTEM = 2
Field width:	7 digits
Tolerance:	+/- 140 feet
Values:	0000000 – 9999999

Item 4.4.5.3 PREVIOUS NORTHING (Y) (PFSL)
[PLOT.HIST_PREV_UTM_NORTHING_Y]

This field indicates the Northing as determined from USGS maps, aerial photos, or a previous plot visit.

When collected:	When COORDINATE SYSTEM = 2
Field width:	7 digits
Tolerance:	+/- 140 feet
Values:	0000000 – 9999999

Item 4.4.5.4 PREVIOUS COORDINATES METHOD (PNW)
[PLOT.PREV_COORDINATE_METHOD_PNWRS]

This field indicates the method by which previous plot coordinates were obtained.

When collected:	Downloaded for most plots	
Field width:	1 character	
Tolerance:	No errors	
Values:	Code	Description
	D	Digitized from USGS maps
	M	Digitized (MDSD) from PI photography (usually small [broad] scale)
	P	Coordinates taken from old PI tables - sometimes computer generated and plotted on maps or digitized from quad maps
	G	Collected at the plot location using a GPS unit
	T	Target (TGT) coordinates originally derived from Albers meters projection
	I	Image (IMG) coordinates derived from ortho photo and rectified to match location of the pinprick
	S	Digitized from SPOT imagery
	N	Coordinates provided by national forests (R5 and R6) - of unknown origin
	C	Hex center

CHAPTER 5 CONDITION CLASS

The Forest Inventory and Analysis (FIA) plot is a cluster of four subplots arranged in a fixed pattern. Subplots are never reconfigured or moved in order to confine them to a single condition class; a plot may straddle more than one condition class. Every plot (contains) least one condition class: the condition class present at Plot Center (PC, the center of subplot 1). Condition class attributes record information about forest structure, composition, and disturbance. This information allows researchers to group and analyze similar forest types, understand management practices used by different landowners, examine the effects of disturbance, and classify land types.

One of the core missions of the FIA program is to estimate and account for changes in forest land. Condition remeasurement protocol and associated data items are designed to allow PNW-FIA to develop change estimates for forest land and timberland by owner groups. PNW FIA reports on the current status of forest land by FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS and TREE DENSITY. Trends and changes are captured by reconciling CONDITION CLASS STATUS, OWNER GROUP, and RESERVED STATUS with previous measurements.

> Note: Regularly scheduled annual remeasurement visits always remeasure the previous regularly scheduled annual visit; NOT special study visits that may have occurred between annual visits.

Condition class attributes describe the portion of the condition within the Area of Observation and provide the ability to analyze and compare landscape and forest characteristics such as structure, composition, disturbance, and ownership.

Area of Observation (AOO) for a condition: The acre portion of the condition that is evaluated to describe the condition class attributes using the following steps:

1. Follow the condition delineation procedures to first determine how many conditions the plot contains.
2. Once this has been completed, determine the shape of the AOO following the procedures below for a Single, Multi, or Split condition plot based on the number of conditions recognized on the plot.
3. Follow the specific guidance associated with each individual condition attribute while describing them within the AOO.

Single condition plot: The AOO is defined by the area contained within four 58.9-foot radius circles originating from subplot centers, the combined area of which is equal to one acre. Ignore any area within the AOO that contains a condition other than the one located at Plot Center (PC). See Figure 5.1.

Multi-condition plot: The AOO is defined by the nearest acre shape in relation to Plot Center (PC) while including all subplots and portions of subplots in the condition being evaluated. See Figure 5.2 and Figure 5.3.

Split condition plot: A split condition plot is a special case of a multi-condition plot. A split condition plot occurs when one condition (condition 2 for example) is split into two or more parts by another condition (condition 1 for example). This results in the need for two or more separate shapes to be created (each proportionally sized to the part of the condition it is representing. Combined, these shapes serve as the AOO. Each shape must include the portion of the subplots in the condition being evaluated, be closest to PC, and remain in the condition being evaluated. Combined, these two shapes should equal an acre. There may be situations where this is not always possible. In such cases, the goal is to visualize a combined acre represented by the combined area of these shapes within condition 1. See Figure 5.4.

Nonsampled Conditions: Nonsampled conditions are treated the same way as sampled conditions with the following exceptions (1) Estimate required condition attributes from the image, and (2) If there appear to be multiple adjoined potential CONDITION CLASS STATUS 1 conditions on a plot, all of which are nonsampled, use the Single condition plot AOO design; (3) If a plot contains both CONDITION CLASS STATUS 5 and one or more additional CONDITION CLASS STATUS 2, 3, or 4 conditions, use the multiple-condition plot AOO design.

Plots without CONDITION CLASS STATUS 1 or 5: When NONFORST SAMPLING STATUS = 0 on plots that only contain 2 or more CONDITION CLASS STATUS 2, 3, and or 4 apply the multi-condition plot method to the condition at PC and apply the result to each subplot.

For conditions that are less than an acre, such as a small developed area, the AOO is defined by the boundaries of the condition itself. In all cases the AOO must remain entirely within the condition being evaluated. Canopy cover checks and TOTAL STEMS counts do not take place within the AOO. They are evaluated within the Canopy cover sample area.

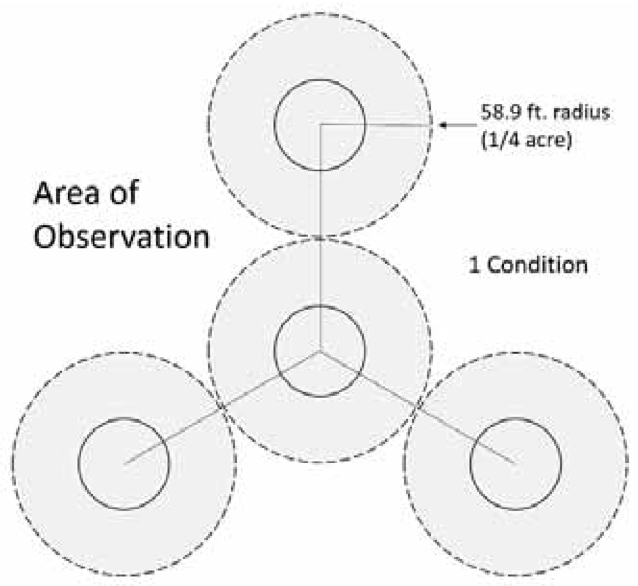


Figure 5.1: Single-condition plot.

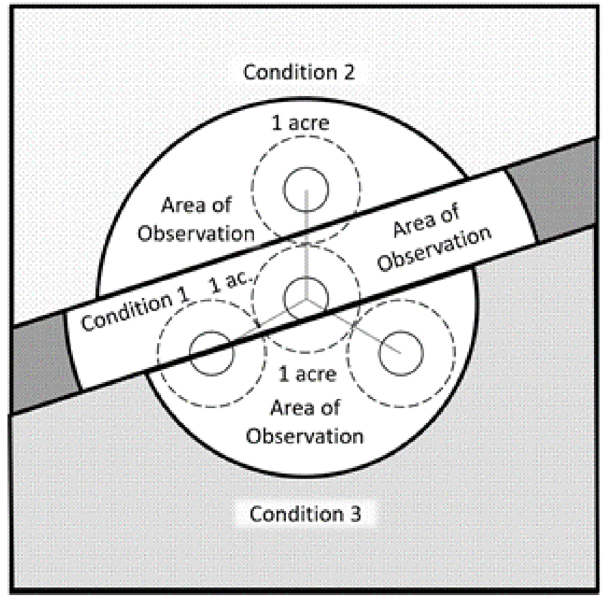


Figure 5.2: Multi-condition plot.

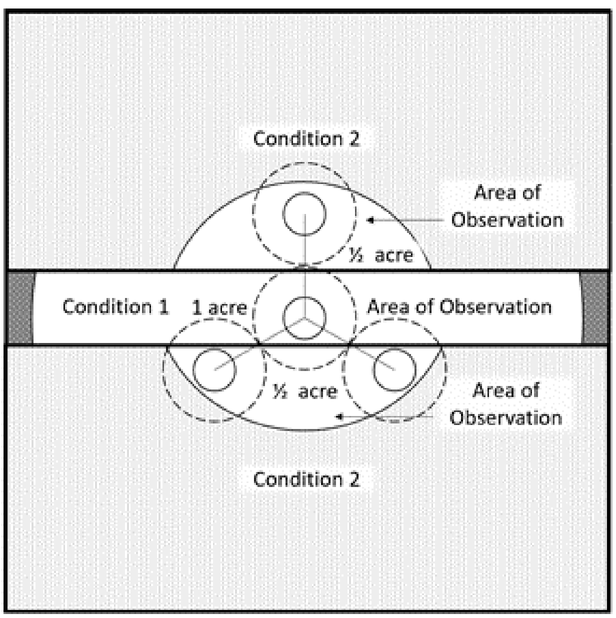


Figure 5.3: Another multi-condition plot.

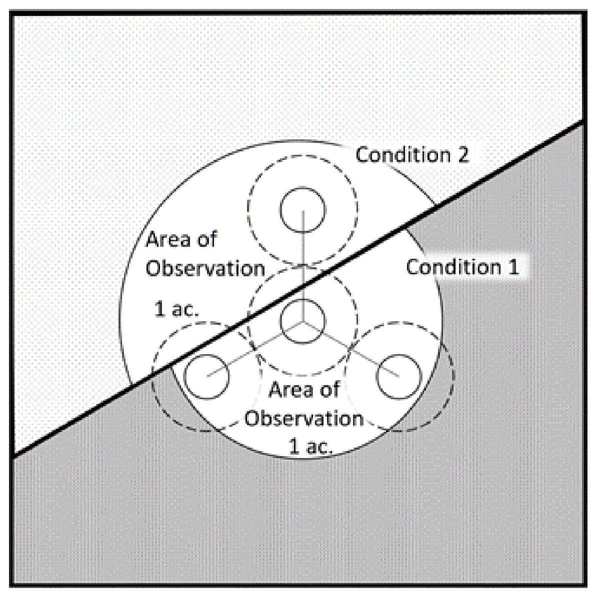


Figure 5.4: Split-condition plot.

SECTION 5.1 DETERMINATION OF CONDITION CLASS

Step 1. Recognize the CONDITION CLASS STATUS on the subplots/macroplots

When NONFOREST SAMPLING STATUS = 0

Step 1. First assess all the following:

1. If the plot does not contain CONDITION CLASS STATUS 1, currently or at the time of the previous visit, or CONDITION CLASS STATUS 5, only recognize the condition present at plot center and assign it to all 4 subplots. When CONDITION CLASS STATUS 2 is the only recognized condition, that condition is also defined by the qualifying PRESENT NONFOREST LAND USE. No delineation is required.

2. If the plot contains CONDITION CLASS STATUS 1, currently or at the time of the previous visit, or contains CONDITION CLASS STATUS 5, recognize the CONDITION CLASS STATUS present at each subplot center.
   a. When subplot center is CONDITION CLASS STATUS = 5 (Nonsampled), code the entire subplot as CONDITION CLASS STATUS 5. No delineation is required.
   b. If a subplot contains CONDITION CLASS STATUS 5 (not at subplot center), but does not contain a CONDITION CLASS STATUS 1, currently or at the time of the previous visit, code the entire subplot as CONDITION CLASS STATUS 5 rather than the CONDITION CLASS STATUS at subplot center. No delineation is required.
   c. When CONDITION CLASS STATUS 2 is recognized at a subplot center, also apply the appropriate PRESENT NONFOREST LAND USE for that condition.

Step 2. If a subplot contains, or contained at the last visit, CONDITION CLASS STATUS = 1 delineate (map) between all qualifying conditions on the subplot unless subplot center is CONDITION CLASS STATUS 5. If subplot center is CONDITION CLASS STATUS 5, no delineation is required.

When NONFOREST SAMPLING STATUS = 1

Recognize and delineate (map) between all CONDITION CLASS STATUSes on each subplot.

1. Accessible forest land
2. Nonforest land
3. Noncensus water
4. Census water
5. Nonsampled – possibility of forest land

Forest land *and measurable nonforest land* define the population of interest for FIA purposes. *These are* the areas where most of the data collection is conducted.

Step 2. Further subdivide accessible forest land by six delineation variables

Any condition class sampled as accessible forest land must be further subdivided, in order of listed priority, into smaller condition classes if distinct, contrasting condition classes are present because of variation in any of the following attributes within the sampled area:

1. RESERVED STATUS
2. OWNER GROUP
3. FOREST TYPE
4. STAND SIZE CLASS
5. REGENERATION STATUS
6. TREE DENSITY

Delineation Note: When NONFOREST SAMPLING STATUS = 0, PRESENT NONFOREST LAND USE is an additional delineating variable within a CONDITION CLASS STATUS = 2 condition on a subplot when it contains, or contained at the previous field visit, accessible forest land. If there is no accessible forest land condition class present within a *macroplot's 58.9-foot* radius, nor did it contain accessible forest land at the previous visit, then the only nonforest condition class will be the one present at the subplot center. Ignore any other nonforest condition classes that may be present.

No other attribute shall be the basis for recognizing contrasting accessible forest land condition classes. For each condition class recognized, several "ancillary attributes" that help describe the condition will be collected, but will not be used for delineation purposes. See Subsection 5.7.2, Ancillary (Non-Delineating) Data Items, for more information.

Note: All condition classes delineated within the 58.9-foot fixed-radius are mapped on the plot card. See Chapter 7, Boundary References, for instruction on how to map condition class boundaries.

Step 3. Further subdivide nonforest land into measurable and non-measurable nonforest.

A nonforest condition class within Region 5 or Region 6 Forest Service administered land boundaries (ADMINISTRATIVE FOREST CODE = 501-699), or within BLM lands in Western Oregon (OWNER CLASS = 22 and BLM RESOURCE AREA is not null), is considered a measurable nonforest condition class (NONFOREST CONDITION CLASS SAMPLING STATUS = 1). Certain data items are recorded in accessible NONFOREST CONDITION CLASS SAMPLING STATUS = 1 condition classes which are not typically measured in nonforest condition classes; these are identified in the associated "when collected" field for individual data items.

Step 4. Further subdivide measurable nonforest into accessible and nonsampled measurable nonforest.

Step 5. Delineate accessible *measurable* Nonforest Land by 3 delineation variables.

Size and width minimums described in Section 5.4 apply to condition delineation for both accessible forest land and accessible nonforest land. Any condition class sampled as *measurable* nonforest land must be further subdivided, in order of listed priority, into smaller condition classes if distinct, contrasting condition classes are present because of variation in any of the following attributes within the sampled area:

1. RESERVED STATUS
2. OWNER GROUP
3. PRESENT NONFOREST LAND USE

This process starts with a CONDITION STATUS = 2 condition that is then subdivided first by RESERVED STATUS then OWNER GROUP. Each resulting condition must meet the minimum size requirement of 120 feet and one acre. Each of these resulting conditions will be further subdivided by PRESENT NONFOREST LAND USE, consistent with their respective size requirements.

SECTION 5.2 CONDITION CLASS STATUS DEFINITIONS

SUBSECTION 5.2.1 ACCESSIBLE FOREST LAND

Accessible forest land is land that is within the population of interest, is accessible, is on a subplot that can be occupied at subplot center, can safely be visited, and meets the following criteria:

Forest Land has at least 10 percent canopy cover of live tally tree species of any size or has had at least 10 percent canopy cover of live tally species in the past, based on the presence of stumps, snags (or other evidence) *that appear to be less than 30 years old.* Additionally, the condition is not subject to nonforest use(s) that prevent normal tree regeneration and succession, such as regular mowing, intensive grazing, or recreation activities.

In contrast to regular mowing, chaining treatments are recognized as long-term periodic or one-time treatments. Although the intent of chaining may be permanent removal of trees, reoccupation is common in the absence of additional treatments and sometimes the treatment does not remove enough to reduce canopy cover below the threshold of forest land. As a result, only live canopy cover should be considered in areas that have been chained; missing (dead or removed) canopy cover is not considered in the forest land call.

In the cases of land on which either forest is encroaching on adjacent nonforest land, or the land that was previously under a nonforest land use (e.g., agriculture or mining) is reverting to forest naturally, only the live cover criterion applies.

In the case of deliberate afforestation - human-assisted conversion of other land use / land cover to forest land -- there must be at least 150 established trees per acre (all sizes combined) to qualify as forest land. Land that has been afforested at a density of less than 150 trees per acre is not considered forest land (see nonforest land below). If the condition experiences regeneration failure or is otherwise reduced to less than 150 survivors per acre after the time of planting / seeding but prior to achieving 10 percent canopy cover, then the condition should not be classified forest land.

To qualify as forest land, the prospective condition must be at least 1.0 acre in size and 120.0 feet wide measured stem-to-stem from the outer-most edge. Forested strips must be 120.0 feet wide for a continuous length of at least 363.0 feet in order to meet the acre threshold. Forested strips that do not meet these requirements are classified as part of the adjacent nonforest land.

When a forest land condition encroaches into a nonforest land condition, the border between forest and nonforest is often a gradual change in tree cover with no clear and abrupt boundary. In addition, it may be difficult to determine exactly where the forested area meets the minimum cover criteria and where it does not. For these situations, determine where the land clearly meets the 10 percent minimum canopy cover, and where it clearly is less than required cover; divide the zone between these points in half, and determine the side of the zone on which the subplot center is located. Classify the condition class of the subplot based on this lineFigure 5.5, using the class criteria above.

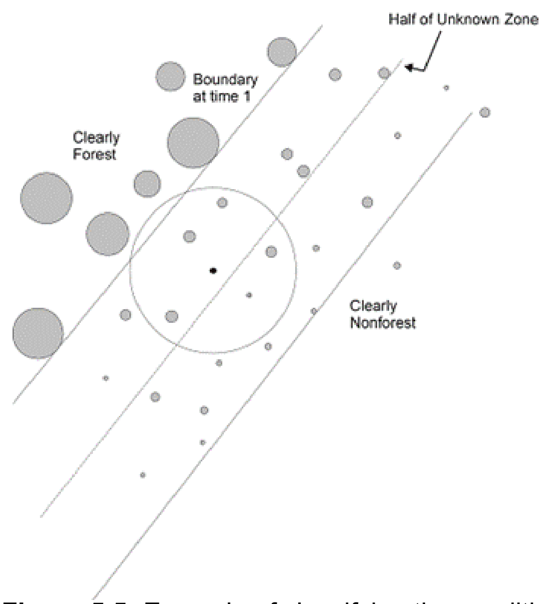


Figure 5.5: Example of classifying the condition class of the subplot in a transition zone with forest/nonforest encroachment.

For example, at measurement time 1, a clear and distinct boundary existed between the forest and nonforest land condition classes. At time 2, however, there now exists a zone of regeneration or small diameter trees between the previous forest condition and where the nonforest clearly remains. If the zone of encroachment is clearly forest where it meets the nonforest, classify the entire zone as forest Figure 5.5. If the zone is clearly nonforest up to the original stand, call it all nonforest. If the encroachment or transition zone is not clearly *forest* where it meets the nonforest, determine where it is clearly forest and where it is clearly nonforest; divide this zone in half, and classify the entire subplot based on which side of the line the subplot center falls.

Treated strips - Occasionally, crews will come across plantations of trees, in which rows of trees alternate with strips of vegetation that have been bulldozed, mowed, tilled, treated with herbicide, or crushed. Because these strip treatments are conducted to optimize growth or to release the stand, the areas are considered forest land, and the treatment is considered a timber stand improvement operation. Do not confuse these practices with similar treatments on nonforest lands such as yards or rights-of-way. Contact with the landowner may help determine the intent of a treatment.

Indistinct boundary due to the condition minimum-width definition - Do not subdivide subplots where a condition class may change due only to the forest vs. nonforest minimum width (120.0 feet) definition. Although the point where the definition changes from forest to nonforest creates an invisible "line" between conditions, this definitional boundary is not distinct and obvious. See Figure 5.6, Figure 5.7 and Figure 5.8. Where the point of the definition change occurs on the subplot, determine only if the subplot center is on the forest or nonforest side of that approximate boundary, and classify the entire subplot based on the condition of the subplot center. If the boundary crosses through the center of the subplot, classify the subplot as the condition it most resembles. If the boundary occurs between subplots, classify each subplot based on its relation to the definitional boundary.

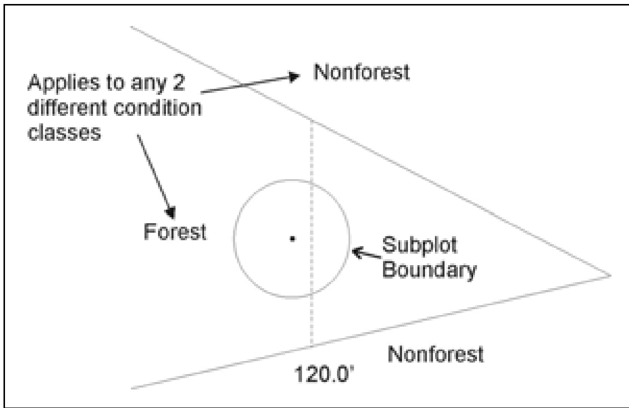


Figure 5.6: Forest condition narrows within a nonforest land condition. Examine the location of the subplot center in reference to the approximate line where the forest narrows to 120.0 feet wide. In this example the entire subplot is classified as forest.

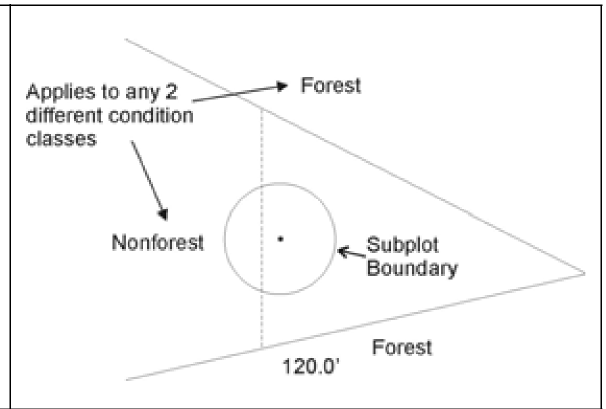


Figure 5.7: Nonforest land condition narrows within a forest condition. Examine the location of the subplot center in reference to the approximate line where the nonforest narrows to 120.0 feet wide. In this example the entire subplot is classified as forest.

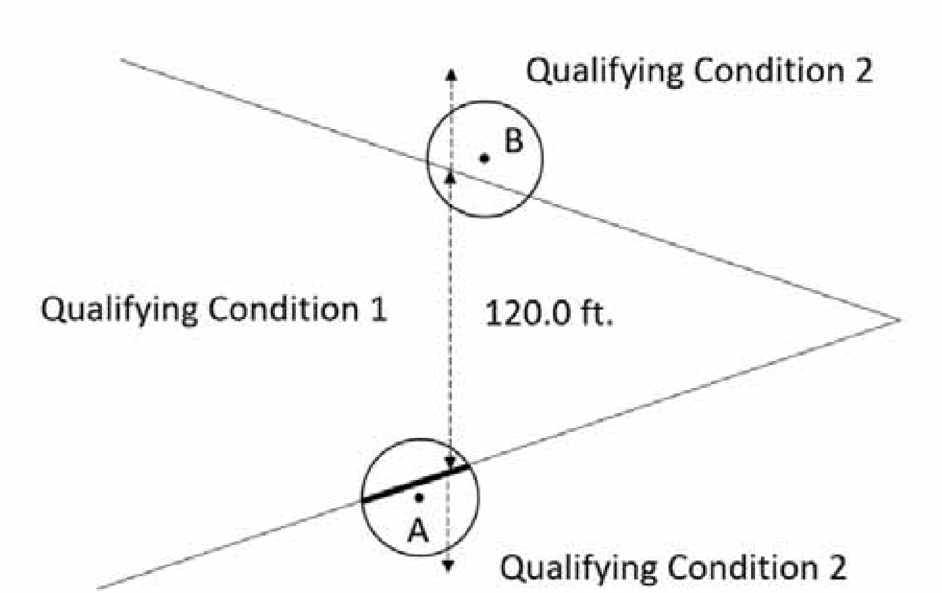


Figure 5.8: Subplot A's center falls within qualifying condition 2. Since subplot A's center falls where condition 1 is greater than or equal to 120 ft wide, delineate a separate condition on the subplot. If, as in the case of subplot B, subplot center falls within a qualifying second condition but condition 1 is less than 120 ft wide, recognize only the condition at subplot center and do not delineate separate conditions or map boundaries on the subplot.

Conditions that meet the 10-percent tree canopy cover threshold may be considered nonforest based on land use. Indications of nonforest use may include current extreme grazing, the absence of forest vegetation, and evidence of human habitation and use around maintained structures such as landscaping, gardens, fences, lawns, and play areas. The absence of forest vegetation means that some or all layers of the species present – trees, shrubs, and forbs – differ from what one would expect on forest land undisturbed by nonforest use. For example, a fenced farm lot may have forest trees present, but if extreme sustained grazing has severely diminished or eliminated forest shrub and forb communities and tree regeneration is stifled, the farm lot is likely nonforest. (in Washington, Oregon, and California: grazing, common on forest lands, is rarely reason to classify a plot as "developed for nonforest use" unless a situation similar to the example is encountered).

SUBSECTION 5.2.2 NONFOREST LAND

Nonforest land is land that has less than 10 percent canopy cover of tally tree species of any size (live + missing) and, in the case of afforested land, fewer than 150 established trees per acre; OR land that has sufficient canopy cover or stems, but is classified as nonforest land use (*the condition is subject to nonforest use(s) that prevent normal tree regeneration and succession, such as regular mowing, intensive grazing, or recreation activities*). Nonforest includes areas that have sufficient cover or live stems to meet the Forest Land definition, but do not meet the dimensional requirements. All *land* conditions not meeting the requirements of forest land will be assigned a PRESENT NONFOREST LAND USE CODE. Multiple PRESENT NONFOREST LAND USEs may be recognized within a CONDITION CLASS STATUS = 2 on a subplot only:

1. when it contains, or contained at the previous field visit, accessible forest land, or
2. where NONFOREST SAMPLING STATUS = 1

Note: A nonforest condition class within Region 5 or Region 6 Forest Service administered land boundaries (ADMINISTRATIVE FOREST CODE = 501-699), or within BLM lands in Western Oregon (OWNER CLASS = 22 and BLM RESOURCE AREA is not null), is considered a measurable nonforest condition class (NONFOREST CONDITION CLASS SAMPLING STATUS = 1). Certain data items are recorded in accessible NONFOREST CONDITION CLASS SAMPLING STATUS = 1 condition classes which are not typically measured in nonforest condition classes; these are identified in the associated "when collected" field for individual data items.

When collected:	All measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)

Macroplot with both Accessible Forest Land and Nonforest Land

Delineate all nonforest condition classes when an accessible forest land condition is present or was present at the previous inventory, or when an accessible measurable nonforest condition class is present, within the 58.9-foot fixed-radius macroplot (see Subsection 5.7.3, Determining Condition Classes on Nonforest Land).

Example: If accessible forest land, nonforest urban land, and nonforest cropland are all present within a 58.9-foot fixed-radius plot, map the forest land condition and map each nonforest land use as a separate condition class.

Macroplot is entirely Nonforest Land

If there is no accessible forest land or was no accessible forest land present at the previous inventory, or if there is no accessible measurable nonforest land condition class present, within a macroplot's 58.9-foot radius, then the only nonforest condition class recognized will be the one present at the subplot center. Ignore any other nonforest condition classes that may be present.

Example: If both nonforest urban land and nonforest cropland make up the entirety of a 58.9-foot macroplot, record only the condition class which occupies the subplot center.

Do not delineate between nonforest and other CONDITION CLASS STATUSes (e.g. Census water, noncensus water, nonsampled conditions) on a macroplot that does not currently contain nor contained at the previous visit accessible forest land, or does not have accessible measurable nonforest conditions. Only recognize the CONDITION CLASS STATUS present at the subplot center. If the CONDITION CLASS STATUS is nonforest at subplot center, assign the entire macroplot with the PRESENT NONFOREST LAND USE at subplot center.

Macroplots with nonforest and nonsampled conditions

If the macroplot has accessible measurable nonforest conditions, map and delineate between all condition class statuses and nonforest land uses.

The following rules apply to macroplots that do not have accessible measurable nonforest conditions.

If a macroplot has both nonforest (CONDITION CLASS STATUS = 2) and nonsampled (CONDITION CLASS STATUS = 5) conditions and **did** have accessible forest land at the previous visit, use previous mapping and boundaries disregarding any potential boundary changes on the macroplot. These plots do not need to be ground visited if there is no accessible forest land present anywhere on the plot. Boundaries will get updated when the nonsampled condition becomes accessible in a future visit.

If a macroplot has both nonforest (CONDITION CLASS STATUS = 2) and nonsampled (CONDITION CLASS STATUS = 5) conditions and did not have accessible forest land at the previous visit, only recognize CONDITION CLASS STATUS present at the subplot center. If the CONDITION CLASS STATUS is nonforest at subplot center, assign the entire macroplot with the PRESENT NONFOREST LAND USE at subplot center.

Plots with nonforest and nonsampled conditions

If a plot only has both nonforest (CONDITION CLASS STATUS = 2) and nonsampled (CONDITION CLASS STATUS = 5) conditions and multiple PRESENT NONFOREST LAND USEs exist on the plot, recognize the PRESENT NONFOREST LAND USE at each subplot center. Code PLOT STATUS = 3 and code each PRESENT NONFOREST LAND USE as a separate condition class in the condition data.

When a subplot center is in a nonsampled condition, code the entire subplot as nonsampled (CONDITION CLASS STATUS = 5).

When PC (Subplot 1 center) is in a nonsampled condition, code subplot 1 as nonsampled, and code the remaining subplots by the CONDITION CLASS STATUS present at each subplot center. If CONDITION CLASS STATUS is 2 (nonforest), code each subplot by the PRESENT NONFOREST LAND USE at subplot center.

Entirely nonforest plots

Record only one condition if the entire plot is currently nonforest and did not contain accessible forest land (CONDITION CLASS STATUS = 1) at the previous visit anywhere on the plot. This includes plots that currently contain both nonforest land uses and Census water or noncensus water conditions. Designate the PRESENT NONFOREST LAND USE that is located at plot center for all four subplots. If Census or noncensus water are the condition present at plot center, designate the entire plot as such (CONDITION CLASS STATUS = 3 or 4).

Plots that do not have accessible forest land nor had accessible forest land at the previous visit, do not contain a nonsampled condition, or do not contain accessible, measurable nonforest condition classes and are entirely nonforest fall into one of the following three categories:

1. The plot is visited on the ground (SAMPLE METHOD CODE = 1)

   A plot file is created in the field data recorder.

   GPS coordinates are collected.

   Only one condition is recorded and the PRESENT NONFOREST LAND USE at plot center is designated for each subplot center.

2. The plot is viewed from a distance (SAMPLE METHOD CODE = 2 or 4)

   A plot file is created in the field data recorder.

   No GPS coordinates are collected.

   Only one condition is recorded and the PRESENT NONFOREST LAND USE at plot center is designated for each subplot center.

3. The plot is not field visited or viewed from a distance. (SAMPLE METHOD CODE = 3 or 4)

   A plot data file is created in the office.

   No GPS coordinates are collected.

   Only one condition is recorded and the PRESENT NONFOREST LAND USE at plot center is designated for each subplot center.

SUBSECTION 5.2.3 NONCENSUS WATER

Noncensus water includes lakes, reservoirs, ponds, and similar bodies of water 1.0 acre to 4.5 acres in size*; and r*ivers, streams, canals, etc. 30.0 feet to 200.*0* feet wide. Water levels fluctuate seasonally and annually; river/stream banks, shorelines, average high water marks, and the point where water prevents the establishment of trees (or woody vegetation/perennial terrestrial plants, where the water feature falls next to nonforest) can be used as guidelines to define the boundary of a water feature. When a noncensus water boundary falls close to a subplot (or macroplot) or is mapped, crews must describe how the boundary was defined in Item 4.3.8.2, PLOT NARRATIVE (PNW) and on the plot diagram, Subsection R.6.4, Plot Access: Location Sketch Map.

If a subplot center (including subplot 1) lands in noncensus water do not install the point, even if it can be occupied safely.

- No field measurements are made on that subplot/macroplot.
- Establish and measure other subplots following normal procedures (see Subsection 3.4.2, Establishing Subplots When Plot Center is Inaccessible, for instructions on how to install a plot without access to plot center).

If the macroplot has an accessible condition at subplot center and has noncensus water present anywhere else within its 58.9-foot fixed-radius boundary:

- Map the noncensus water area as a separate condition class.
- Use normal procedures to map and measure other condition classes.
- Record the segment lengths of any down woody material (DWM) transects that extend into the noncensus water condition (see Section 11.5, Transect Line Segmenting). No other field measurements are made within the noncensus condition class.

SUBSECTION 5.2.4 CENSUS WATER

Census water includes ocean, lakes, reservoirs, ponds, and similar bodies of water 4.5 acres in size and larger; and rivers, streams, canals, etc. more than 200 feet wide (1990 U.S. Census definition). Water levels fluctuate seasonally and annually; river/stream banks, shorelines, average high water marks, and the point where water prevents the establishment of trees (or woody vegetation/perennial terrestrial plants, where the water feature falls next to nonforest) can be used as guidelines to define the boundary of a water feature. When a census water boundary falls close to a subplot (or macroplot) or is mapped, crews must describe how the boundary was defined in Item 4.3.8.2, PLOT NARRATIVE (PNW) and on the plot diagram, Subsection R.6.4, Plot Access: Location Sketch Map.

If a subplot center (including subplot 1) lands in Census water, do not install the point, even if it can be occupied safely.

- No field measurements are made on that subplot/macroplot.
- Establish and measure other subplots following normal procedures (see Subsection 3.4.2, Establishing Subplots When Plot Center is Inaccessible, for instructions on how to install a plot without access to plot center).

If the macroplot has an accessible condition at subplot center and has Census water present anywhere else within its 58.9-foot fixed-radius boundary:

- Map the Census water area as a separate condition class.
- Use normal procedures to map and measure other condition classes.
- Record the segment lengths of any DWM transects that extend into the Census water condition (see Section 11.5, Transect Line Segmenting). No other field measurements are made within the Census condition class.

SUBSECTION 5.2.5 NONSAMPLED, POSSIBILITY OF FOREST

See CONDITION NONSAMPLED REASON (Item 5.9.0.1) for descriptions of land that qualifies as nonsampled. In cases where a condition is access-denied or hazardous land use, but obviously contains no forest land, record CONDITION CLASS STATUS = 2, 3 or 4. In cases where a condition is access-denied or hazardous land use and has the possibility of forest, record CONDITION CLASS STATUS = 5.

If a subplot center (including subplot 1) is located in any nonsampled area, as described in CONDITION NONSAMPLED REASON, the entire subplot is considered to be nonsampled. Record the attributes as described in Section 5.9, Nonsampled Condition Class Attributes. Establish and measure other subplots following normal procedures. A plot, subplot, or portion of a subplot is hazardous according to the crew's judgment.

If an entire plot is nonsampled, record only one nonsampled condition: the condition at plot center.

If the center of a subplot is accessible, but there is a nonsampled area within the 58.9-foot fixed-radius boundary:

- Map the nonsampled area as a separate condition class.
- Use normal procedures to map and measure other condition classes.
- Record the segment lengths of any DWM transects that extend into the nonsampled condition (see Section 11.5, Transect Line Segmenting) and complete the nonsampled condition class attributes described in Section 5.9.

SECTION 5.3 DELINEATING CONDITION CLASSES DIFFERING IN CONDITION CLASS STATUS

The first step in delineating condition classes is to recognize differences in CONDITION CLASS STATUS. The most common difference is adjacent accessible forest land and nonforest land. Adjacent accessible forest land and nonforest land condition classes are recognized only if each of the two prospective condition classes is at least 1.0 acre in size, and each is at least 120.0 feet in width. These size and width minimums apply to both accessible forest land and nonforest land.

Within an accessible forest land condition class, unimproved roads, rock outcrops, and natural nonforest openings less than 1.0 acre in size and less than 120.0 feet in width are considered forest land and are not delineated as a separate nonforest land condition class.

Within a nonforest land condition class, forested areas or linear strips of trees less than 1.0 acre in size and less than 120.0 feet in width are considered part of the nonforest land condition class.

Six exceptions to these size and width requirements apply:

1. Developed nonforest land condition: human-caused nonforest land condition classes such as homes or cabins that are less than 1.0 acre in size and 120.0 feet in width and are surrounded by forest land. There are three kinds of developed nonforest land conditions that do not have to meet area or width requirements *(see Figure 5.9, and Figure 5.10)*.
   A. Improved roads: paved roads, gravel roads, or improved dirt roads regularly maintained for long-term continuing use *by normal passenger vehicles.* Generally constructed using machinery. The area where the original topography has been disturbed by cutbanks and fill is considered part of the road, if that area is maintained. Unimproved traces and roads created for skidding logs are not considered improved roads.
   B. Maintained rights-of-way: corridors created for railroads, power lines, gas lines, and canals that are periodically treated to limit the establishment and growth of trees and shrubs. Areas under power lines are considered maintained rights-of-way even if no current vegetation treatment is evident.
   C. Developments: structures and the maintained area next to a structure, all less than 1.0 acre in size and surrounded by forest land. Examples of developments are houses or trailers on very small lots, communication installations in a small cleared area within forest land, and barns and sheds.
2. Distinct, alternating strips of forest and nonforest land: this situation occurs when a plot or subplot samples a condition class that is less than 1.0 acre in size and less than 120.0 feet in width. The condition class is one of a series of parallel strips of forest and nonforest land in which none of the strips meet the minimum width requirement. This exception applies only to nonforest land conditions that are not listed under *exception number* 1, e.g., improved roads, maintained rights-of-way, and developments *(Figure 5.11)*.

Figure 5.9: Example with a developed nonforest strip <120 feet wide. Forest strip, while <120 feet wide, is still part of the accessible forest land condition.

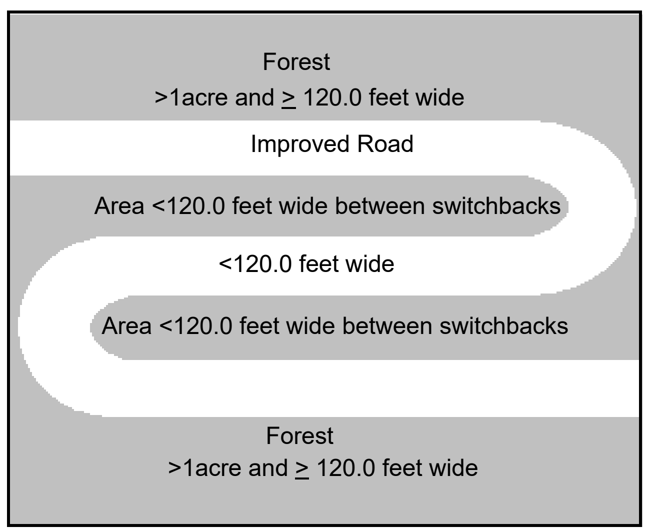


Figure 5.10: Example of a switchback road where the area between the switchbacks is still forest land.

A. Many small intermingled strips: For many small intermingled strips, determine the total area that the intermingled strips occupy, and classify according to the CONDITION CLASS STATUS (forest land or nonforest land) that occupies the greater area. If the area of intermingled strips is so large or indistinct as to make a total area determination impractical, then classify the sample as forest land.

B. Two alternating strips: For two alternating strips of forest and nonforest between two qualifying areas of nonforest land and forest land, see Figure 5.11. *This figure* delineates the boundary between the forest and nonforest land condition classes for four different examples. The plot center defines the plot condition for all strips covered by the arrow. Any subplot that falls in the alternating strips uses this rule. Any subplot that falls in assigned nonforest / forest is assigned that type. Again, this exception applies only to nonforest land conditions that are not listed under *exception* number 1, e.g., improved roads, maintained rights-of-way, and developments.

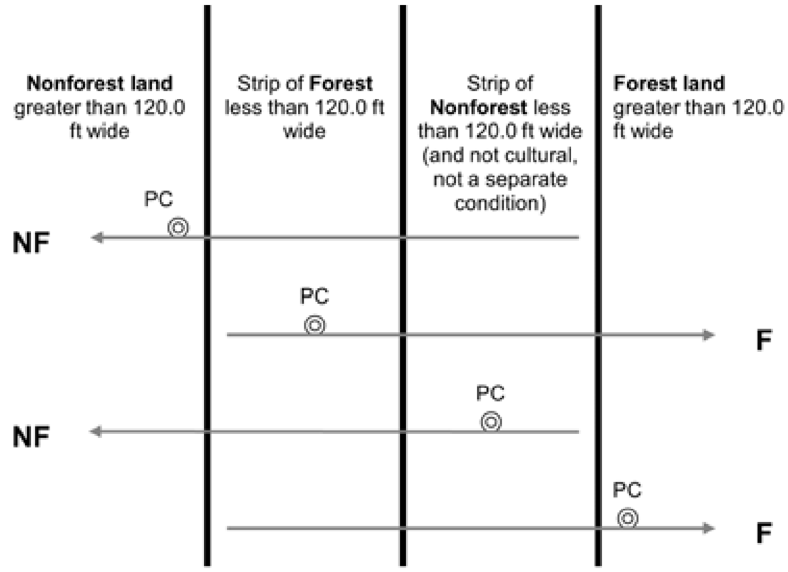


Figure 5.11: Example of alternating strips of forested and nonforested conditions. PC is the plot center (center of subplot 1).

3. The 120.0-foot minimum width for delineation does not apply when a corner angle is 90 degrees or greater (see Figure 5.12*)*.

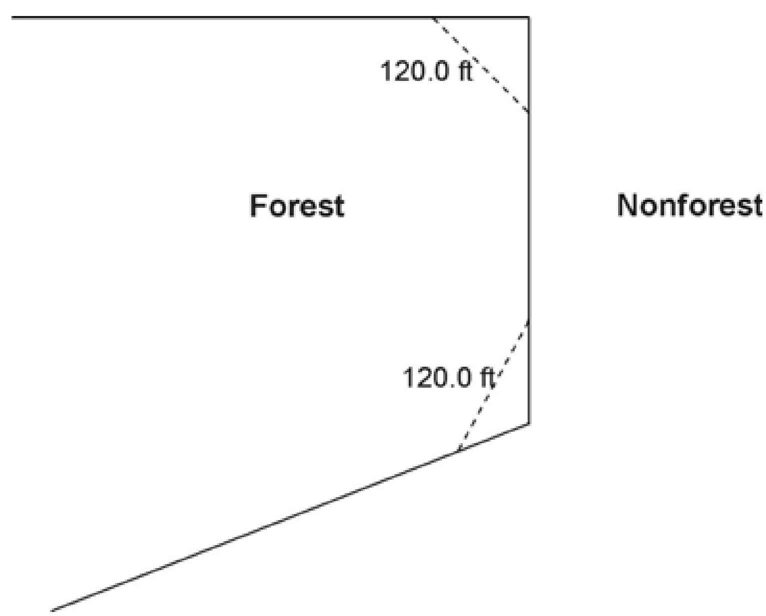


Figure 5.12: Illustration of the 90 degree corner rule. The dotted lines do not create nonforest land conditions.

4. Linear water features: natural water features that are linear in shape such as streams and rivers. A linear water feature must meet the definition for Census or noncensus water to be *a separate condition class*. Therefore, a linear water feature must be at least 30.0 feet wide and cover at least 1.0 acre. The width of a linear water feature is measured *according to the guidelines given in Subsection 5.2.3, Noncensus Water and Subsection 5.2.4, Census Water*. To determine whether a linear water feature qualifies as *a separate condition class*, rely on all available information on hand such as aerial photos, topographic maps, past survey land calls, and ocular estimates at the current survey visit. Linear water features that do not meet the definition for Census or noncensus water should be classified as forest land only if bounded by forest land on both shores. Crews are not expected to measure the length of a linear water feature to determine if it meets the 1.0 acre requirement; use professional judgment and common sense on any linear water feature. A 30-foot wide stream needs to be 1452 feet long to be an acre in size.

5. Nonsampled conditions are delineated as a separate condition class regardless of size.

SECTION 5.4 DELINEATING CONDITION CLASSES WITHIN ACCESSIBLE FOREST LAND

Accessible forest land is subdivided into condition classes that are based on differences in RESERVED STATUS, OWNER GROUP, FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, and TREE DENSITY. Section 5.1, Determination of Condition Class, applies when delineating contrasting forest condition classes. Specific criteria apply for each of the six attributes and are documented by attribute in Item 5.7.1.1 (RESERVED STATUS) through Item 5.7.1.15 (TREE DENSITY). "Stands" are defined by *the* plurality of stocking/canopy cover for all live trees, saplings, and seedlings that are not overtopped within the Area of Observation.

Additionally, each separate forest condition class recognized within accessible forest land must be at least 1.0 acre in size and at least 120.0 feet in width. If prospective contrasting forest land condition classes do not each meet these minimum size and width requirements, the most similar prospective conditions should be combined until these minimums are attained.

No other attribute shall be the basis for recognizing contrasting condition classes within accessible forest land. For each condition class recognized, many "ancillary attributes" that help describe the condition will be collected, but will not be used for delineation purposes See Subsection 5.7.2 Ancillary (Non-Delineating) Data Items.

General instructions for delineating condition classes within accessible forest lands:

1. Distinct boundary within a macroplot, subplot, or microplot – Separate condition classes ARE recognized if, within a *macroplot*, subplot, *or microplot*, two (or more) distinctly different condition classes are present and delineated by a distinct, abrupt boundary. The boundary is referenced (see Boundary References, Chapter 7).
2. Indistinct boundary within a subplot – Separate condition classes are NOT recognized if the prospective condition classes abut along an indistinct transition zone, rather than on an abrupt, obvious boundary. Only one condition is recognized, and the subplot is classified entirely as the condition it most resembles.

   Example: The four subplots all sample only accessible forest land. Subplots 1, 3, and 4 sample what is clearly a stand of large-diameter trees. Subplot 2 falls in the middle of a stand-size transition zone. In the zone, the large-diameter stand phases into a sapling stand.

   Subplot 2 must not be divided into two condition classes on the basis of stand size. Instead, it is treated entirely as part of the large-diameter condition class or is assigned entirely to a new condition class that is classified as a seedling-sapling stand. The latter occurs only if the crew thinks the entire subplot is more like a stand of seedlings-saplings than a stand of large-diameter trees; then the boundary between the large- and small-diameter stands is assumed to occur between and not on the subplots.

3. A boundary or transition zone between fixed-radius subplots that sample distinctly different condition classes – Separate condition classes are recognized and recorded when a valid attribute obviously differs between two fixed-radius subplots, but a distinct boundary or indistinct transition zone exists outside the sampled (fixed-radius) area of the *macroplots*. In such cases, a boundary, if present, is not referenced.

   Example: The northernmost subplot (2) samples entirely accessible forest land. The other three subplots *(*1, 3, and 4*)* fall clearly in a nonforest meadow. Between subplot 1 and 2 is a transition zone; the number of trees present goes from none to what clearly represents forest land. Two condition classes are sampled: accessible forest land sampled on subplot 2, and nonforest land sampled on the other subplots.

4. Riparian forest area – A riparian forest area is defined as a forest area between 30.0 and 120.0 feet wide, and 1.0 acre or more in size *(*cumulative*)* and adjacent to but not necessarily present on both sides of a naturally occurring or artificially created body of water or watercourse with continuous or intermittent flow. Riparian forest areas may be associated with but not limited to streams, rivers, lakes, sloughs, seeps, springs, marsh*e*s, bogs, beaver ponds, sink holes, cypress domes and ponds, *hu*man-made ditches and canals. A riparian forest area must be associated "within forest" *(i.e., must be surrounded by forest on at least one side)* and contain at least one distinct and obvious change in a condition class delineation attribute from its adjacent accessible forest land condition class. Figure 5.13 through Figure 5.18 provide examples of when to delineate riparian forest area as a separate

<u>condition class.</u> This special size allowance for an accessible riparian forest land condition class only applies if the riparian area would otherwise meet the definition for accessible forest land (i.e., the riparian area meets canopy cover requirements and is not subject to nonforest land uses as described in Subsection 5.7.3).

<u>Note: When the width of forest adjacent to a body of water or water course is between 120.0 feet and 150.0 feet and the width of the riparian forest is at least 30.0 feet wide, the rules for identifying the non-riparian forest (at least 30.0 feet but less than 120.0 feet) need to be modified. The non-riparian forest can be between 30.0 feet and 120.0 feet and mapped as a separate condition as long as it meets the criteria for delineating a separate condition class, otherwise it will be an inclusion in the riparian forest condition class.</u>

A riparian forest area (i.e., a band of alder trees along a creek within a Douglas-fir condition class) is typically different from the surrounding forest because of forest type. However, a change in any of the six condition class delineating variables may make it a candidate for a riparian area condition class.

An area 30 feet wide needs to be 1452 feet long to be an acre in size. An area 60 feet wide needs to be 726 feet long, and an area 90 feet wide needs to be 484 feet long to be an acre in size.

Because chaparral is considered nonforest (see Subsection A.2.2, R5 Chaparral Rules), riparian areas through chaparral must qualify as accessible forest land (120 feet wide and 1-acre in size) on their own in order to be delineated as a separate condition class.

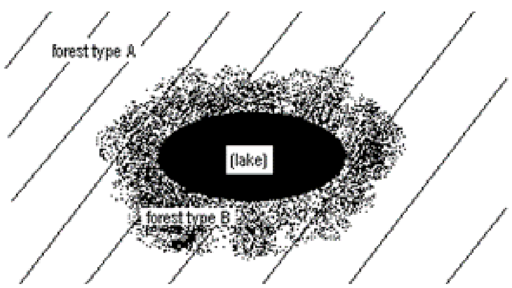


Figure 5.13: Forest type B is separate condition class (riparian) if the band of it is between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

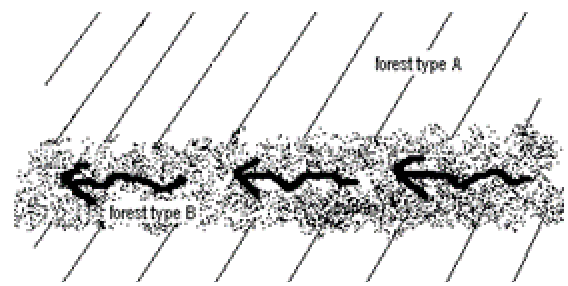


Figure 5.14: Forest type B is a separate condition class (riparian) if the band of it is between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

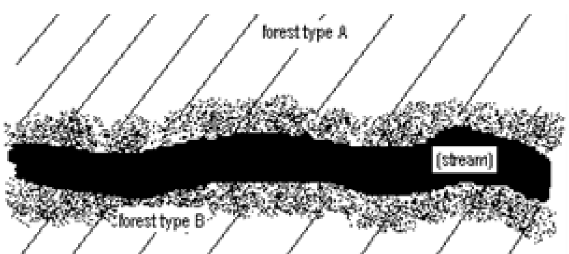


Figure 5.15: If the stream is < 30.0 feet wide, forest type B is a separate condition class (riparian) if the sum of the two widths of the bands including the stream falls between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

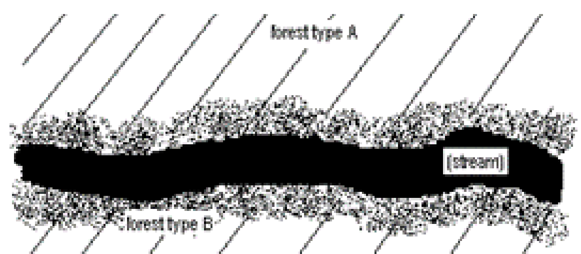


Figure 5.16: If the stream is > 30.0 feet wide, forest type B is a separate condition class (riparian) if either of the two widths of the bands falls between 30.0 feet and 120.0 feet wide and is ≥ 1.0 acre in size.

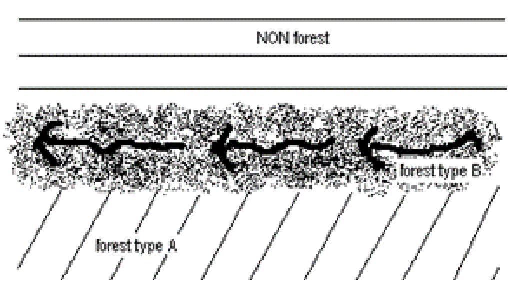


Figure 5.17: Forest type B is a separate condition class (riparian) if the band of it is between 30.0 feet and 120.0 feet wide, and is <u>></u> 1.0 acre in size.

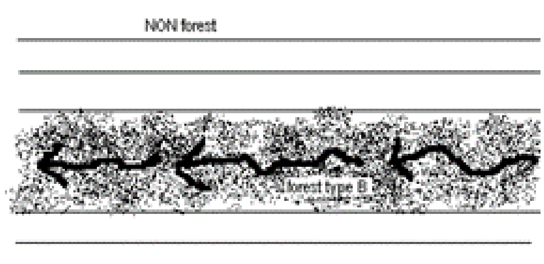


Figure 5.18: In a nonforested area, a band of forest type B that is < 120.0 feet wide is NOT considered a riparian area. It is not a separate condition class at all.

SECTION 5.5 CONDITION CLASS ATTRIBUTES

A CONDITION CLASS NUMBER and a classification for CONDITION CLASS STATUS are required for every condition class sampled on a plot.

SUBSECTION 5.5.1 ACCESSIBLE FOREST LAND

For each condition class classified as accessible forest land, a classification is required for each required condition-level variable. The following are the only ones that force delineation of a separate condition:

Item 5.7.1.1, RESERVED STATUS (CORE 2.5.1)	ATTRIBUTES WHERE A CHANGE CAUSES A SEPARATE *ACCESSIBLE FOREST LAND* CONDITION CLASS
Item 5.7.1.5, OWNER GROUP (CORE 2.5.2)	
Item 5.7.1.9, FOREST TYPE (CORE 2.5.3)	
Item 5.7.1.11, STAND SIZE CLASS (CORE 2.5.4)	
Item 5.7.1.13, REGENERATION STATUS (CORE 2.5.5)	
Item 5.7.1.15, TREE DENSITY (CORE 2.5.6)	

All other condition-level variables are ancillary; do not delineate new condition classes based on any of the ancillary variables.

Remeasurement plots: The downloaded condition class delineation data items should always be reviewed and updated as necessary. If changes have occurred, reassess the condition class boundaries mapped by the previous crew. On remeasurement plots use the plot card, and the boundary viewer in printout located in the plot jacket to review the previous condition class layouts and assess whether any change has occurred. See Chapter 7, Boundary References, for further instruction regarding boundary mapping.

SUBSECTION 5.5.2 NONFOREST LAND

For each condition class classified as nonforest land, a classification is required for a subset of the condition class attributes. The following are the only ones that force delineation of a separate condition:

Item 5.7.1.1, RESERVED STATUS (CORE 2.5.1)	ATTRIBUTES WHERE A CHANGE CAUSES A SEPARATE *NONFOREST* CONDITION CLASS
Item 5.7.1.5, OWNER GROUP (CORE 2.5.2)	
Item 5.7.3.1, PRESENT NONFOREST LAND USE (CORE 2.5.29) *(for subplots that contain, or contained during the previous field visit, accessible forest land; or where NONFOREST SAMPLING STATUS = 1)*	

All other condition-level variables are ancillary; do not delineate new condition classes based on any of the ancillary variables.

SECTION 5.6 CONDITION REMEASUREMENT

Identifying change between the previous and current inventories is a complex process that requires two or three steps depending on whether the plot is undergoing the first (previous data is correctable) or second remeasurement. This process clearly separates previous crew error from physical change (on the ground) and procedural change.

SUBSECTION 5.6.1 CORRECTING PREVIOUS CONDITION AND/OR BOUNDARY ERRORS, PREVIOUS CONDITIONS ARE CORRECTABLE

The following protocol should be applied to plots undergoing the first remeasurement of previous inventory data only when previous data are correctable.

Step 1. Correcting previous crew error

Before mapping the current condition on any macroplot, review:

- All previous mapping
- PREVIOUS CONDITION CLASS STATUS
- PREVIOUS OWNER GROUP
- PREVIOUS RESERVED STATUS

Verify that PREVIOUS CONDITION CLASS STATUS, PREVIOUS OWNER GROUP, and PREVIOUS RESERVED STATUS had been correct at the last measurement. Review the previous mapping to determine if errors exist in the previous condition mapping. Previous data errors can be corrected at any time, however, it is easier to correct them as early as possible.

Do not change any of these values if they were correct under the previous protocol; see Tables 5.1 and 5.2 for a list of procedural changes and manual clarifications. In addition, data item text from the previous inventory has been included for all condition class data items that must be updated if an error was found in PREVIOUS CONDITION CLASS STATUS or PREVIOUS OWNER GROUP. Review the previous data item text before updating any data item values.

For example, on Region 5 or 6 NFS lands, if the previous crew deemed a condition to be forested because the land was (and still is) covered by curlleaf mountain-mahogany, do not change the PREVIOUS CONDITION CLASS STATUS to nonforest.

For example, if a previous crew deemed a condition to be forested under the previous definition of forest that was based on stocking, but the condition does not meet the current definition of forest that is based on canopy cover, do not change the PREVIOUS CONDITION CLASS STATUS to nonforest.

In past years, procedures affecting CONDITION CLASS STATUS, OWNER GROUP and RESERVED STATUS have been clarified.

For example, if a subplot center lands in noncensus or Census water, the entire subplot/macroplot is considered noncensus or Census water. Sometimes field crews established the subplot when they could occupy the center because it was not covered by water at the time and potentially mapped other condition classes present on the subplot/macroplot. This was clarified in a later manual as incorrect procedure; for the purpose of remeasurement, this is considered “crew error” and needs to be corrected.

If any of the previous boundary mapping azimuths (left, right, or corner) or PREVIOUS CORNER DISTANCE are changed, the PREVIOUS CONDITION CLASS NUMBER (PNW)(Item 8.5.1.6) of the trees on that subplot will have to be verified and manually reassigned.

Step 2. Map and record current conditions

Use the previous condition mapping (or corrected if changed in step 1) as a base for mapping the current condition. Boundaries and condition classes can be added or deleted, and condition class attributes can be altered. Record current CONDITION CLASS STATUS, OWNER GROUP, and RESERVED STATUS.

Step 3. Reconcile current with previous conditions

If the previous and current conditions are different for CONDITION CLASS STATUS, OWNER GROUP, or RESERVED STATUS, reconcile them as either physical change or procedural change. No other delineating data items need to be reconciled. Previous crew errors should be changed in step 1. The data recorder will only prompt a change reconcile code if any of the above three data items are different.

Adding or deleting previous conditions

The data recorder allows entire conditions to be added or deleted in order to correct a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP **only**. If a condition is added, all previous condition data items (such as PREVIOUS FOREST TYPE and PREVIOUS STAND SIZE CLASS) need to be updated to reflect the condition as it was at the previous measurement.

For example, if the previous crew missed that subplot 2 belonged to a different OWNER GROUP, add another condition in the previous condition class screen. Update the PREVIOUS OWNER GROUP, PREVIOUS OWNER CLASS, to reflect correct owner information at the time of the previous inventory. All of the other condition data item values may be copied from the original condition if they are correct. If any of them are incorrect, update to reflect what it should have been at the time of the previous inventory. Include detailed notes explaining changes to any previous condition data items in PREVIOUS CONDITION NOTES.

Changing PREVIOUS CONDITION CLASS STATUS from nonforest to forest

If PREVIOUS CONDITION CLASS STATUS changes from nonforest to forest, the suite of delineating and non-delineating data items associated with forest conditions will need to be added for the previous data items (e.g. PREVIOUS FOREST TYPE) to reflect the correct values at the time of the previous measurement.

Reconcile all trees on this condition that should have been measured previously as cruiser error because they are considered a missed tree (Item 8.5.1.11, RECONCILE (CORE 5.7.1)). Reconcile trees that grew enough to be a tally tree now but previously too small as either “ingrowth” or “through-growth.”

Changing PREVIOUS CONDITION CLASS STATUS from forest to nonforest

If PREVIOUS CONDITION CLASS STATUS changes from forest to nonforest, the suite of delineating and non-delineating data items associated with nonforest conditions will need to be added for the previous data items (e.g. PREVIOUS NONFOREST LAND USE) to reflect the correct values at the time of the previous measurement.

If the previous crew call is changed from forest to non-measurable nonforest, reconcile all trees on that condition as “cruiser error” (Item 8.5.1.11, RECONCILE (CORE 5.7.1)).

Changing previous boundary mapping

If the boundary data mapped at the previous inventory (azimuths or PREVIOUS CORNER DISTANCE) is edited by the current crew, the data recorder will automatically delete the PREVIOUS CONDITION CLASS NUMBER for the trees tallied on that subplot. The current crew will have to manually assign those tallied trees to a PREVIOUS CONDITION CLASS NUMBER. If the subplot center PREVIOUS CONDITION CLASS NUMBER or PREVIOUS CONTRASTING CONDITION is changed, the data recorder will automatically update the PREVIOUS CONDITION CLASS NUMBER for trees tallied at the previous inventory on that subplot. If only condition level attributes are changed, the PREVIOUS CONDITION CLASS NUMBER does not have to be updated at all.

Minor changes of previous azimuths and PREVIOUS CORNER DISTANCE should be avoided. If the azimuth and distance are edited, the data recorder will automatically display a warning if the difference between previous crew mapping and edited mapping is less than 10 percent.

A boundary (or boundaries) should only be corrected if the correction results in a 10 percent or greater difference in the area of a condition class on the radius being mapped. There are two exceptions:

- The previous boundary should be corrected if the correction results in a condition class presence/absence due to an error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP. Do not add or delete boundaries based on previous errors in any other condition class delineating variable.
- If a subplot boundary correction changes the condition class at subplot center, the equivalent macroplot boundary must also be corrected.

Example 1: A road goes through the middle of a subplot. The previous crew boundaries for the road were mapped to the edge of the pavement. You know the cutbanks should have been included as road area. Correcting the boundary on one side of the road results in a 6 percent increase in the area of the road condition. Correcting the boundary on the other side of the road results in a 5 percent increase in the area of the road condition. Considered together, the corrections increase the road area by 11 percent, so the corrections should be made.

Example 2: The previous crew mapped the edge of a forest condition class at the drip-line of the trees. You know they should have mapped to the boles of the trees. Correcting the subplot boundary results in an area difference greater than 10 percent on the subplot. It also changes subplot center from forest to nonforest. Even though correcting the macroplot boundary does not result in a 10 percent area difference on the macroplot, the macroplot boundary must be corrected.

Example 3: The previous crew did not map any boundaries on the subplot. You decide that a sliver of forest is present on the subplot and should have been mapped. The area of the forest sliver is only 2 percent. However, since it is a presence/absence scenario, the previous boundary must be added. If a tree is tallied and is assigned to the forest condition class, the data recorder will generate an error if the forest condition is not mapped on the subplot.

Explanatory Notes

If the current crew corrects any previous data items, an explanation describing why values were changed is required in Item 5.10.1.2, CONDITION CLASS NOTES (PNW). Include what was determined to be wrong and describe, in detail, the reason the current crew knows a previous error was made.

If a previous condition class is added, an explanation describing the reason for the addition is required in Item 5.10.1.2, CONDITION CLASS NOTES (PNW). Describe, in detail, the reason the current crew knows a previous error was made.

If a previous condition class is deleted, an explanation describing the reason for the deletion is required in Item 4.3.5.5, PLOT NOTES (CORE 1.21). Describe, in detail, the reason the current crew knows a previous error was made.

See Appendix S, Maper Table, for further instructions on where to write explanatory notes for all types of scenarios.

SUBSECTION 5.6.2 RECONCILING PREVIOUS CONDITION AND/OR BOUNDARY ERRORS, PREVIOUS DATA ARE NOT CORRECTABLE

The following protocol applies to plots undergoing the second remeasurement (previous data are not correctable).

Step 1. Map and record current conditions

Use the previous condition mapping as a base for mapping the current condition. Boundaries and condition classes can be added or deleted, and condition class attributes can be altered in the current condition and boundary screens only. Record current CONDITION CLASS STATUS, OWNER GROUP, and RESERVED STATUS.

Step 2. Reconcile current with previous conditions

If the previous and current conditions are different for CONDITION CLASS STATUS, OWNER GROUP, or RESERVED STATUS, reconcile them as either physical change, previous crew error or procedural change. No other delineating data items need to be reconciled. The data recorder will only prompt a change reconcile code if any of the above three data items are different.

Refer to Tables 5.1 and 5.2 for a list of procedural changes and manual clarifications that are considered crew error.

Previous Crew Error Examples

Condition Omissions/Inclusions - these occur when a previous crew missed a condition change, or delineated (added) a condition incorrectly based on CONDITION CLASS STATUS, RESERVED STATUS or OWNER GROUP. Omitted/included conditions are only added or deleted in the current condition class screen and reconciled as previous crew error in the Change Matrix. Any associated boundaries are added or deleted from the current boundary screen only with a BOUNDARY CHANGE CODE of 2 assigned to the missed boundaries.

For example, the previous crew missed that subplot 2 belonged to a different OWNER GROUP. At the current inventory this is reconciled as previous crew error in OWNER GROUP RECONCILE CODE. Include a detailed explanation in the new condition record CONDITION CLASS NOTES. Reconcile all trees in omitted or included conditions as Cruiser Error (Item 8.5.1.11, RECONCILE (CORE 5.7.1)). Reconcile trees that grew enough to be a tally tree now but previously were too small as either ingrowth/ reversions or through-growth.

CONDITION CLASS STATUS errors - these occur when CONDITION CLASS STATUS was incorrectly classified at the previous inventory. At the current inventory this is reconciled as previous crew error in CONDITION CLASS STATUS RECONCILE CODE in the Change Matrix.

RESERVED STATUS errors - these occur when RESERVED STATUS was incorrectly classified at the previous inventory. At the current inventory this is reconciled as previous crew error in RESERVED STATUS RECONCILE CODE in the Change Matrix.

OWNER GROUP errors - these occur when OWNER GROUP was incorrectly classified at the previous inventory. At the current inventory this is reconciled as previous crew error in OWNER GROUP RECONCILE CODE in the Change Matrix.

Boundary Mapping errors - these occur when boundaries were mapped incorrectly at the previous inventory, and the difference between previous crew mapping and edited mapping is greater than 10% or is a boundary presence/absence issue. Update mapping in the current boundary screen only and assign BOUNDARY CHANGE CODE of 2. Include a boundary note explaining in detail the reason why previous mapping is in error. Boundary mapping errors may also occur when there is a missed or added condition.

Explanatory Notes

If the current crew updates any data items, an explanation describing why values were changed is required in Item 5.10.1.2, CONDITION CLASS NOTES (PNW). Include what was determined to be wrong and describe, in detail, the reason the current crew knows a previous error was made.

If a condition class is added due to previous crew error, an explanation describing the reason for the addition is required in Item 5.10.1.2, CONDITION CLASS NOTES (PNW). Describe in detail, the reason the current crew knows a previous error was made.

If a condition class is deleted, an explanation describing the reason for the deletion is required in Item 5.10.1.3, CHANGE MATRIX NOTES (PNW). Describe, in detail, the reason the current crew knows a previous error was made.When the previous crew added a condition based on FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, or TREE DENSITY, and the current crew deletes it from the current condition data, an explanation describing the reason for deletion is required in Item 4.3.5.5, PLOT NOTES (CORE 1.21).

See Appendix S, Maper Table, for further instructions on where to write explanatory notes for all types of scenarios.

Table 5.1: Procedural changes

	Procedural Change Description	Affected species/parameters	Manual year
Relating to condition delineating data items: Changes older than the previous visit date are no longer applicable and provided for reference only			
	Area of Observation (AOO) defines the area for assessing condition level variables	RESERVED STATUS and OWNER GROUP	2022
	Master Species List added to be a comprehensive list of all species found in all inventories in the national FIA program.	CONDITION CLASS STATUS	2020
	Changes to the methodology of coding nonsampled measurable nonforest conditions.	NONFOREST CONDITION CLASS STATUS is only recorded when NONFOREST CONDITION CLASS SAMPLING STATUS = 1 (i.e. the nonforest condition is measurable). NONFOREST CONDITION CLASS SAMPLING STATUS (measurable vs. non-measurable nonforest) is now coded before NONFOREST CONDITION CLASS STATUS (accessible nonforest vs. nonsampled nonforest). This change auto-populates plot level NONFOREST SAMPLING STATUS based on NONFOREST CONDITION CLASS SAMPLING STATUS rather than ADMINISTRATIVE FOREST CODE.	2018
	Change in RESERVED STATUS definition	Excluding all private lands (e.g. Nature Conservancy) and providing a list of State and Federal agency lands considered reserved (Appendix N). Wilderness Study Areas are not considered reserved.	2013
	Chaining treatments only consider Live Canopy Cover in the forest land definition	CONDITION CLASS STATUS	2013
	30 year rule implemented, to establish time line for condition status changing disturbance	CONDITION CLASS STATUS	2013
	Forestland definition change from 10 percent stocking to 10 percent canopy cover	CONDITION CLASS STATUS	2013
	Forestland definition change for all western woodland species from 5 percent canopy cover to 10 percent canopy cover	CONDITION CLASS STATUS	2013
	Added new NONFOREST LAND USE codes	Codes 16: Maintained Wildlife Opening, 17: Windbreak/Shelterbelt, 34: Mining, 43: Beach	2011

Table 5.1: Procedural changes			
	Nonsampled measurable nonforest changed from being coded as a nonsampled condition (CONDITION STATUS = 5). Now it is coded as CONDITION STATUS = 2 (nonforest) and NONFOREST CONDITION CLASS STATUS = 5 (nonsampled nonforest).	CONDITION CLASS STATUS	2011
	Species dropped from Tree Species List (i.e., species is now considered a shrub)	▪ Curlleaf mountain-mahogany ▪ Rocky Mountain maple	2010
	If land was previously managed by a different agency, the owner group of the agency was recorded. Now the owner group of the owner is recorded.	OWNER GROUP = 10, 20 OR 30	2010
	Added new NONFOREST LAND USE codes	Code 42: Vegetated Wetlands	2010
	Stocking algorithm change	Stocking values are evaluated by SPECIES using one of two stocking tables based on 1 acre	2009
	RESERVED STATUS changed from being collected only when accessible forest land (CONDITION STATUS = 1) or measured nonforest land on Forest Service administered lands (CONDITION STATUS = 2 and ADMINISTRATIVE FOREST CODE = 501 - 650). Now it is collected on all conditions classes (CONDITION STATUS = 1, 2, 3, 4 or 5).	RESERVED STATUS	2008
	Stocking algorithm change	Stocking values are evaluated by tree SPECIES using one of seven stocking tables based on 1/4 acre or 1 acre areas, instead of FOREST TYPE.	2004
	Stocking values change	Western juniper	2004
	Two STAND SIZE CLASS rule dropped	STAND SIZE CLASS had to be two size classes away from initial size class to delineate a new condition class	2004
Relating to non-delineating data items:			
	STAND AGE codes 997, 998, and 999 no longer have “embedded” meaning; they can be recorded as true age values.	All forest land condition classes	2010
	Treatment codes 14 and 15 no longer have a 1-acre minimum size requirement to code.	Treatment codes 14 and 15	2010

Table 5.2: Manual clarifications that must be corrected		
		Manual year
Manual clarifications: Changes older than the previous visit date are no longer applicable and provided for reference only		
	Figure 5.8 added as a clarification to the Indistinct boundary due to condition minimum-width definition rules.	2022
	Census Water (CONDITION CLASS STATUS = 4) is considered state owned and should be recorded as OWNER GROUP = 30	2016
	Strips of forest area between switchbacks is not considered nonforest land	2008
	Nonforest structures or buildings and hazardous cliffs are mapped using a “wedge” (Informal clarification)	2006
	If subplot center is in noncensus or Census water, the entire subplot/macroplot is classified as noncensus or Census water and no mapping is done.	2003
	Areas under power lines are considered maintained rights-of-way	2002

SUBSECTION 5.6.3 RECONCILE CURRENT WITH PREVIOUS

The purpose of the reconciliation is to distinguish physical (on the ground) change from any procedural change. At the time of second remeasurement, an additional reconcile code (previous crew error) will be available for use because errors are no longer being corrected. For each subplot, the data recorder will calculate a change matrix that includes percent macroplot area (subplot if macroplot was not measured) for each previous - current condition combination. If the previous and current condition values for CONDITION CLASS STATUS, OWNER GROUP, and RESERVED STATUS are not the same, the field crew must reconcile them as either physical or procedural change, or previous crew error at second remeasurement, by recording the appropriate code for OWNER GROUP RECONCILE CODE, CONDITION CLASS STATUS RECONCILE CODE, RESERVED STATUS RECONCILE CODE. If they are the same, nothing has to be reconciled by the field crew. When RECONCILE CODES other than 0 are recorded, a detailed note describing the change is required in Item 5.10.1.3, CHANGE MATRIX NOTES (PNW).

Any changes for data items other than CONDITION STATUS, OWNER GROUP, and RESERVED STATUS are not reconciled.

Reconciliation example:

At time 1, the entire subplot is forested. At time 2 the field crew notices a recently built road.

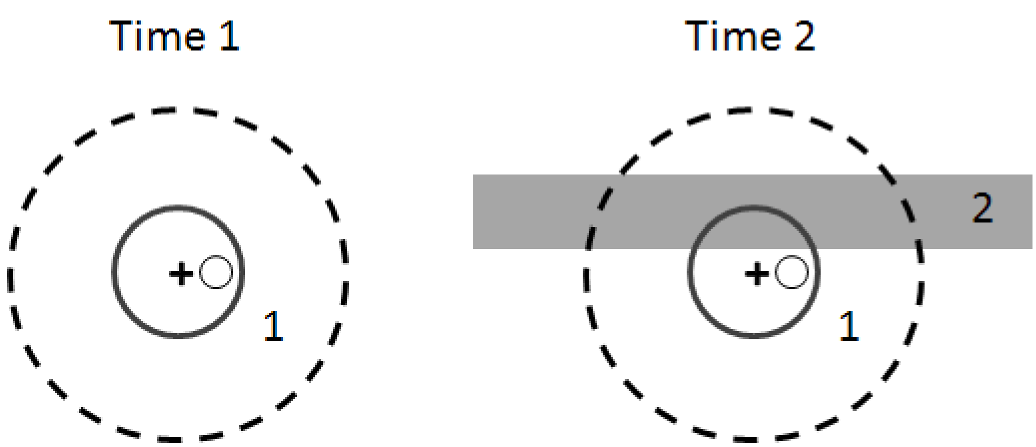


Table 5.3: Condition change matrix

PLOT TYPE	SUBPLOT NUMBER	CONDITION CLASS NUMBER		SUBPLOT CONDITION PROPORTION	CONDITION CLASS STATUS			OWNER GROUP			RESERVED STATUS		
		t1	t2		t1	t2	reconcile	t1	t2	reconcile	t1	t2	reconcile
3	1	1	1	0.92	1	1	0	40	40	0	0	0	0
3	1	1	2	0.08	1	2	1	40	40	0	0	0	0

Table 5.4: Condition change matrix key

t1: time 1 t2: time 2		
Reconcile codes:		
	0	no change (auto-filled by data recorder)
	1	physical change
	2	previous crew error - only valid when PREVIOUS DATA CORRECTED = N
	3	procedural change

After mapping the current condition, the field crew reconciles the condition change. As displayed in the condition change matrix, the field crew only has to fill in the CONDITION CLASS STATUS RECONCILE CODE for the change from forest to road. All previous / current condition combinations with percent area of the plot are calculated by the data recorder. OWNER GROUP and RESERVED STATUS as well as the CONDITION CLASS STATUS for CONDITION CLASS NUMBER 1 (at time 1) to 1 (at time 2) are automatically reconciled by the data recorder with “0” (no change).

Example 1:

Previous mapping

- At time 1, the entire plot was mapped as one forested condition on private land.

Current situation

- The entire plot is still forested. On subplot 2 the current crew maps a separate condition because part of that subplot has OWNER GROUP = 10 (Forest Service). At the reconciliation step, the data recorder prompts the crew to reconcile the change as either procedural or physical change, or previous crew error at second remeasurement. The crew determines that the Forest Service owned this land at the time of the previous visit.

What should you do?

- If the plot is undergoing its first remeasurement, (previous data correctable) go back to step 1 in Subsection 5.6.1 and edit the previous (incorrect) condition class data items and boundary mapping. After editing the previous information, the data recorder will not prompt to reconcile any changes. Since a boundary was added, the PREVIOUS CONDITION CLASS NUMBER for trees tallied at time 1 will have to be manually entered.
- If the plot is undergoing its second remeaurement (previous data not correctable), follow instructions in step 1 of Subsection 5.6.3 and update OWNER GROUP in the current condition class record, map and record the boundary in the current boundary screen. Reconcile the OWNER GROUP change as previous crew error with code 2 in the Change Matrix.

Example 2:

Previous mapping

- On subplot 2, the previous crew mapped a meadow (less than 1 acre) that is surrounded by forest as a nonforest condition.

Current situation

- Nothing has changed on the plot. The previous mapping was incorrect because the meadow does not meet the size requirements to be considered a separate condition. It should have been included as part of the “forested condition”.

What should you do?

- If the plot is undergoing its first remeasurement, (previous data correctable) correct the previous crew error by deleting the nonforest condition in the current and previous condition data (if not present and valid elsewhere on plot), deleting the boundary in the current and previous boundary data, and assigning the entire subplot to the forested condition. Nothing will need to be reconciled in the CHANGE MATRIX because all errors are removed from the data.
- If the plot is undergoing its second remeasurement (previous data not correctable), delete the nonforest condition (if not present and valid elsewhere on plot), delete the boundary and assign the entire subplot to the forested condition. Reconcile the CONDITION STATUS change in the Change Matrix as previous crew error with code 2.

Example 3 Plots undergoing second remeasure (previous data not correctable):

Previous mapping

- On subplot 1, the previous crew mapped an improved road surrounded by privately owned forest.

Current situation

- The improved road has been decommissioned and is no longer being maintained. The past crew also missed a BLM ownership boundary along one side of the road.

What should you do?

- Reconcile the Condition Status change in the Change Matrix as physical change with code 1. Then reconcile the Owner Group change in Change Matrix as previous crew error with code 2.

Example 4 Plots undergoing second remeasurement (previous data not correctable):

Previous mapping

- On subplot 1 the previous crew mapped an improved road surrounded by forest land.

Current situation

- The improved road has been decommissioned and is no longer being maintained. The past crew also missed a nonforest rangeland condition along one side of the road.

What should you do?

- Reconcile the Change Matrix line showing CONDITION STATUS going from forest to nonforest as previous crew error with code 2. Reconcile the Change Matrix line showing CONDITION STATUS going from nonforest to forest as physical change with code 1.

Example 5 Plots undergoing second remeasure (previous data not correctable):

Previous mapping

- On subplot 1 the previous crew mapped an improved road surrounded by forest land.

Current situation

- The improved road has been decommissioned and is no longer being maintained. It was also obvious that the past crew made an error > 10% mapping their road boundaries.

What should you do?

- In this scenario the Change Matrix only has space for one reconcile code. In this example there was a combination of both physical change and previous crew error so crews will have to select one option.

  The Change Matrix reconcile codes follow a hierarchy. Physical change > Procedural change > previous crew error.

  Use the following logic: If physical change exists, then always reconcile with physical change. If the choice is between previous crew error and procedural change, then go with procedural change. If a situation forces a choice between multiple reconcile codes, CHANGE MATRIX NOTES are required describing the other type of change present.

Example 6 Plots undergoing second remeasure (previous data not correctable):

Previous mapping

- The previous crew recorded the entire plot as a single forested condition.

Current situation

- It was obvious the previous crew made an error and should have called the entire plot nonforest. Currently, due to real change the plot is now considered entirely forest.

What should you do?

In this situation, the Change Matrix will not prompt for a condition status change to be reconciled because the previous condition status and current condition status are the same. There will be no way to record either the previous crew error or the physical change. In this case, make detailed CONDITION CLASS NOTES describing the previous crew error and physical change.

SECTION 5.7 GENERAL CONDITION CLASS ATTRIBUTES

General attributes such as CONDITION CLASS NUMBER and a classification for CONDITION CLASS STATUS are required for every condition class sampled on a plot.

Item 5.7.0.1 CONDITION CLASS NUMBER (CORE 2.4.1)
[COND.CONDID][CHANGE_MATRIX_PNWRS.CONDID]

On a plot, assign and record a number for each condition class. The condition class at plot center (the center of subplot 1) is designated condition class 1. Number condition classes sequentially as encountered going from subplot 1 through 4, numerically. For remeasurement plots retain the PREVIOUS CONDITION CLASS NUMBER assignments whenever possible, even if they were assigned in the wrong order.

When collected:	All condition classes
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 5.7.0.2 PREVIOUS CONDITION CLASS NUMBER (PNW)
[PREV_COND_PNWRS.CONDID][CHANGE_MATRIX_PNWRS.PREV_CONDID]

A downloaded value that may be updated when PREVIOUS DATA CORRECTABLE = Y if an error was made by the previous crew. If updated, change the number for that condition class.

When collected:	When SAMPLE KIND = 2
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 5.7.0.3 SUBPLOT CONDITION PROPORTION (PNW)
[CHANGE_MATRIX_PNWRS.PERCENT_AREA]

Proportion of macroplot/subplot condition for all previous and current condition class combinations, see Reconciling Previous Condition and/or Boundary Errors, Previous Data are not Correctable, Subsection 5.6.2, pg.90 and Table 5.3, “Condition change matrix,” on page 93. This data item is calculated by the data recorder and displayed to the user.

When collected:	When SAMPLE KIND = 2 and CHANGE MATRIX REQUIRED = Y
Field width:	3 digits
Tolerance:	No errors when a boundary is added, missed or mapped in the wrong location as a result of a protocol violation. ± 10% when a boundary is added, missed or mapped in the wrong location as a result of azimuth and distance differences between the production crew and QA inspector. ± 10% of a condition’s mapped area on a subplot /macroplot for multiple boundaries mapping the same condition within a subplot/macroplot.
Values:	001 - 100

Item 5.7.0.4 CONDITION CLASS STATUS (CORE 2.4.2)
[COND.COND_STATUS_CD][CHANGE_MATRIX_PNWRS.COND_STATUS_CD]

Record the code that describes the status of the condition. The instructions in Delineating Condition Classes Differing in Condition Class Status (Section 5.3) and Condition Class Attributes (Section 5.5) apply when delineating condition classes that differ by CONDITION CLASS STATUS. In situations where a condition is denied access or hazardous, but obviously contains no forest land, record CONDITION CLASS STATUS = 2, 3 or 4. In cases where a condition is access-denied or hazardous land use and has the possibility of forest, record CONDITION CLASS STATUS = 5.

When collected:	All condition classes	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Accessible forest land
	2	Nonforest land
	3	Noncensus water
	4	Census water
	5	Nonsampled - possibility of forest land

Item 5.7.0.5 PREVIOUS CONDITION CLASS STATUS (PNW)
[COND.PREV_COND_STATUS_CD_PNWRS]
[CHANGE_MATRIX_PNWRS.PREV_COND_STATUS_CD_PNWRS]
[PREV_COND_PNWRS.COND_STATUS_CD]

A downloaded value that may be updated when PREVIOUS DATA CORRECTABLE = Y if an error was made by the previous crew. If updated, record the code that describes the status of the condition at the previous measurement. Note: PREVIOUS CONDITION CLASS STATUS has already been updated to current codes. An update to this field requires an explanatory note in the electronic CONDITION CLASS NOTES.

When collected:	Downloaded when SAMPLE KIND = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Accessible forest land
	2	Nonforest land
	3	Noncensus water
	4	Census water
	5	Nonsampled - possibility of forest

Item 5.7.0.6 CONDITION CLASS STATUS RECONCILE CODE (PNW)
[CHANGE_MATRIX_PNWRS.COND_STATUS_RECONCILE]

Record a code indicating which type of change to CONDITION CLASS STATUS occurred. When PREVIOUS DATA CORRECTABLE = Y only physical or procedural change codes are valid. When PREVIOUS DATA CORRECTABLE = N all three codes are valid. If a change occurred, CHANGE MATRIX NOTES must be recorded to describe what the change is (e.g., new road construction).

When collected:	When SAMPLE KIND = 2 and CHANGE MATRIX REQUIRED = Y	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Change
	0	No change (reconciled by data recorder, not a valid code for field crew)
	1	Physical change
	2	Previous crew error
	3	Procedural change

Item 5.7.0.7 CONDITION CLASS STATUS PROCEDURAL CHANGE REASON CODE (PNW)
[CHANGE_MATRIX_PNWRS.COND_STATUS_PRCD_CHNG_REASN_CD]

Record a code indicating which procedural change occurred. Use code 99 (other) only if one of the other procedural change reason codes do not apply.

When collected:	CONDITION CLASS STATUS RECONCILE CODE = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Change
	01	Juniper stocking table changes

	02	Species no longer qualifies as tree species (curlleaf mountain-mahogany on Region 5 or 6 NFS lands or Rocky Mountain maple)
	03	Forest land definition change from 10 percent stocking to 10 percent canopy cover
	05	Forest land conversions due to master species list
	99	Other (explanatory CHANGE MATRIX NOTES required)

Item 5.7.0.8 FOREST LAND CONDITION STATUS CHANGE (CORE 2.4.3)

New Forest Condition or Loss of Previous Forest Condition

Field protocol change, physical change on the ground, and crew error can all have an effect on new forested conditions (not originating from a previous forested condition) moving onto a plot or previously forested conditions being reclassified to a condition status other than forest land between field visits. The purpose of this variable is to identify what caused:

1. A new forested condition (not originating from a previous forested condition) to be recognized on the plot,

   And / Or

2. A previously forested condition IS no longer recognized as forest land on the plot

Examples:

At time 1 a condition is recognized as idle farm land and at time 2 that same condition now meets the forest land definition due to the additional canopy cover provided by a new species that has been added to the species list (such as Bradford pear) between visits. This new forested condition would be coded as FOREST LAND CONDITION STATUS CHANGE = 3.

At time 1 a 100 x 363-foot block of tally trees (with 10% canopy cover) outlined by a 30-foot strip of dense non-tally buckthorn was considered an inclusion within a condition recognized as crop land. Between visits, buckthorn was added to the species list. At time 2, the combined area of the initial block of trees and the strip of buckthorn met the forestland definition, causing the previous nonforest condition to be reclassified as a new forested condition. The resulting forested condition would be coded as FOREST LAND CONDITION STATUS CHANGE = 3.

A forested condition at time 1 could potentially be reclassified to a nonforest land use at time 2 if a species that contributed over 90% of the condition's canopy cover was dropped from the species list between visits. The resulting nonforest condition would be coded as FOREST LAND CONDITION STATUS CHANGE = 3.

If the construction of a new home caused a previously designated forested condition (a small woodlot) to drop below the forest land minimum size requirement, the resulting nonforest condition would be coded as FOREST LAND CONDITION STATUS CHANGE = 1.

All forested conditions that remain forested between visits 1 and 2 (regardless if their area has expanded or contracted on the plot) would be coded as FOREST LAND CONDITION STATUS CHANGE = 0, as would new CONDITION CLASS STATUS = 2, 3, or 4 conditions that are NOT the direct result of a previous forest condition no longer qualifying as forest land. For example, if a new road was established within a forested condition, and in the process eliminated the forested condition from the plot, it would be coded as FOREST LAND CONDITION STATUS CHANGE = 1. If the previous forested condition remains on the plot and is now just smaller in area the due to the addition of the road the FOREST LAND CONDITION STATUS CHANGE = 0.

1. Did this condition originate from a previously forested condition coded on the plot?
   A. NO, code FOREST LAND CONDITION STATUS CHANGE > 0 (physical/real, crew error, procedural change)
   B. YES, go to 2
2. Is the original condition still coded on plot?
   A. YES, code FOREST LAND CONDITION STATUS CHANGE = 0, no change
   B. NO, code FOREST LAND CONDITION STATUS CHANGE > 0 (physical/real, crew error, procedural change)

When collected:	CONDITION CLASS STATUS = 1, 2, 3, or 4 on remeasured plots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	No change -- the condition is not a new forested condition (not originating from a previous forested condition) nor is it a new condition that is the result of a previously forested condition no longer qualifying as such or the condition was previously not field visited or was previously classified as non-sampled.
	1	Physical changes - condition status changed due to actual on-the-ground physical change either natural or human-caused.
	2	Crew error - condition status changed due to a previous crew's error.
	3	Procedural changes - condition status changed due to a change in variable definition or procedures.

Item 5.7.0.9 NONFOREST CONDITION CLASS SAMPLING STATUS (PNW)
[COND.NF_COND_SAMPLE_STATUS_PNWRS]

An auto-populated code that indicates whether this nonforest condition class (CONDITION CLASS STATUS = 2) is part of a nonforest inventory. A nonforest condition class within Region 5 or Region 6 Forest Service administered land boundaries (ADMINISTRATIVE FOREST CODE = 501-699), or within BLM lands in Western Oregon (OWNER CLASS = 22 and BLM RESOURCE AREA is not null), is considered a measurable nonforest condition class (NONFOREST CONDITION CLASS SAMPLING STATUS = 1). Certain data items are recorded in accessible NONFOREST CONDITION CLASS SAMPLING STATUS = 1 condition classes which are not typically measured in nonforest condition classes; these are identified in the associated "when collected" field for individual data items.

When collected:	When CONDITION CLASS STATUS = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	Nonforest condition is not measurable
	1	Nonforest condition is measurable (ADMINISTRATIVE FOREST CODE = 501-699), or (OWNER CLASS = 22 and BLM RESOURCE AREA is not null)

Item 5.7.0.10 NONFOREST CONDITION CLASS STATUS (CORE 2.4.5)
[COND.NF_COND_STATUS_CD]

Record the code that describes the sampling status of the condition class (see the *NONFOREST CONDITION NONSAMPLED REASON codes* below for additional information).

When collected:	When NONFOREST CONDITION CLASS SAMPLING STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	2	Accessible nonforest land
	5	Nonsampled nonforest

Item 5.7.0.11 NONFOREST CONDITION NONSAMPLED REASON (CORE 2.4.6)
[COND.NF_COND_NONSAMPLE_REASN_CD]

For portions of plots that are *measurable* nonforest land and can not be sampled (NONFOREST CONDITION CLASS STATUS = 5), record one of the following reasons.

When collected:	When NONFOREST CONDITION CLASS STATUS = 5	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	02	Denied access - Any area within the sampled area of a plot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. There are no minimum area or width requirements for a condition class delineated by denied access. Because a denied-access condition can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
	03	Hazardous situation - Any area within the sampled area on plot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present. There are no minimum size or width requirements for a condition class delineated by a hazardous condition.
	10	Other - This code is used whenever a condition class is not sampled due to a reason other than one of the specific reasons listed. *An electronic CONDITION CLASS NOTE* is required to describe the situation.

SUBSECTION 5.7.1 ACCESSIBLE FOREST LAND DELINEATING DATA ITEMS

Data items described in this subsection determine if accessible forest land qualifies to be subdivided into separate condition classes. Section 5.1, Determination of Condition Class, applies when delineating contrasting forest condition classes based on these data items.

Some of these data items are collected regardless of condition status (e.g., RESERVED STATUS and OWNER GROUP are collected on all conditions).

Item 5.7.1.1 RESERVED STATUS (CORE 2.5.1)
[COND.RESERVCD][CHANGE_MATRIX_PNWRS.RESERVCD]

Record the code that identifies the reserved designation for the condition. Reserved land is withdrawn by law(s) prohibiting the management of land for the production of wood products (not merely controlling or prohibiting wood-harvesting methods). Such authority is vested in a public agency or department, and supersedes rights of ownership. The prohibition against management for wood products cannot be changed through decision of the land manager (management agency) or through a change in land management personnel, but rather is permanent in nature. Such areas include: Congressionally designated wilderness areas, national parks, state parks, and other lands protected by law or deed. For conditions with both reserved and not reserved areas, neither of which is an acre in size, the condition will be defined by the predominant RESERVED STATUS within the Area of Observation.

Ownership and the name (designation) of an area are critical for determining reserved status. All private lands (OWNGRPCD = 40) are considered not reserved (due to difficulty in determining legal status); this includes in-holdings, where they can be identified. FIA has adopted a default national list of federal land designations which are considered reserved (see Appendix N). All federally-owned lands managed by the National Park Service or Fish and Wildlife Service (OWNCD = 21 or 23) are considered reserved. Some lands owned by State or local governments are considered reserved, even in the absence of specific laws covering them, if the agency mandate for that land designation precludes management to produce wood products (e.g., most State Parks). In the absence of State-specific lists of reserved areas, any State or local government land area that includes "park", "wilderness", "wild river", "reserve", or "preserve" in the name is by default considered reserved. There are less common designations that are not on the CORE list and may add exceptions to the list for specific areas that are managed under different legal guidance than is usual for that designation. All designations must be documented using the RESERVED AREA NAME field. Note that harvest can occur in reserved areas, for example for restoration, safety, or recreation.

Nonforest areas are reserved if forest lands in the same designated area are considered reserved, or if the area would be considered reserved if forestland was present.

Note: The value for this data item may be downloaded (at least for condition class 1) for all plots. However, when field visited, check to be sure the value is correct for the condition.

When collected:	All condition classes	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	Not reserved
	1	Reserved

Item 5.7.1.2 PREVIOUS RESERVED STATUS (PNW)
[PREV_COND_PNWRS.RESERVCD][CHANGE_MATRIX_PNWRS.PREV_RESERVCD]

A downloaded value that may not match the code on the printout from the previous visit. Some codes were updated in the office to reflect the status at the time of the previous inventory using the Core 6.0 definition of RESERVED STATUS. The primary changes are that all National Recreation Areas and National Monuments are considered reserved, while Research Natural Areas and privately owned lands are now considered not reserved. However, the downloaded value may be incorrect due to the imprecision of the GIS layers or the plot-center coordinate. For example, the downloaded value may be 1 (reserved), but in reality the plot is located just outside a park boundary. If corrected, record the code that identifies the reserved designation for the condition at the previous measurement using the Core 6.0 RESERVED STATUS definition. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y. An update to this field requires an explanatory note in the electronic CONDITION CLASS NOTES.

When collected:	Downloaded when SAMPLE KIND = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Previous Reserved Status
	0	Not reserved
	1	Reserved

Item 5.7.1.3 RESERVED STATUS RECONCILE CODE (PNW)
[CHANGE_MATRIX_PNWRS.RESERVCD_RECONCILE]

Record a code indicating which type of change to RESERVED STATUS occurred. When PREVIOUS DATA CORRECTABLE = Y only physical or procedural change codes are valid. When PREVIOUS DATA CORRECTABLE = N all three codes are valid. If a change occurred, CHANGE MATRIX NOTES must be recorded to describe what the change is (e.g., new wilderness area).

When collected:	When SAMPLE KIND = 2 and condition change occurred	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Change
	0	No change (reconciled by data recorder, not a valid code for field crew)
	1	Physical change
	2	Previous crew error
	3	Procedural change

Item 5.7.1.4 RESERVED STATUS PROCEDURAL CHANGE REASON CODE (PNW)
[CHANGE_MATRIX_PNWRS.RESERV_PRCD_CHNG_REASN_CD]

This code describes the reason a procedural change in RESERVE STATUS occurred.

When collected:	RESERVED STATUS RECONCILE CODE = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	01	Change in definition of RESERVED STATUS (Core 6.0, 2013) excluding all private lands (e.g. Nature Conservancy) and providing a list of State and Federal agency lands considered reserved (Appendix N)
	99	Other (explanatory CHANGE MATRIX NOTES required)

Item 5.7.1.5 OWNER GROUP (CORE 2.5.2)
[COND.OWNGRPCD][CHANGE_MATRIX_PNWRS.OWNGRPCD]

Record the OWNER GROUP code identifying the ownership of the land in the condition class. Separate conditions *because of* changes in OWNER GROUP are recognized only where differences can be clearly identified on the ground when visiting the plot *(e.g., blazed trees or posted boundary signs)*. For conditions with multiple OWNER GROUPS, none of which are an acre in size, the condition will be defined by the predominant OWNER GROUP within the Area of Observation. When federal land is owned and administered by two separate entities (e.g., BLM and Forest Service), this data item records the legal owner of the land, not the administrator. Census Water (CONDITION CLASS STATUS = 4) is considered state owned and should be recorded as OWNER GROUP = 30. Noncensus Water (CONDITION CLASS STATUS = 3) assumes the same ownership as adjacent land.

Note: The value may be downloaded (at least for condition class 1 from the current field season review tables); however, check to be sure it is correct.

When collected:	All condition classes	
Field width:	2 digits	
Tolerance:	No errors	
Value:	Code	Description
	10	Forest Service
	20	Other Federal
	30	State and Local Government
	40	Private

Item 5.7.1.6 PREVIOUS OWNER GROUP (PNW)
[CHANGE_MATRIX_PNWRS.PREV_OWNGRPCD][PREV_COND_PNWRS.OWNGRPCD]

On remeasurement plots this item will be populated directly from the previous visits OWNER GROUP data item. Examine the PREVIOUS OWNER GROUP field and determine if it was correctly coded at the previous visit. If the OWNER GROUP of the condition actually changed, do not update this field; change will be captured by comparing OWNER GROUP at the prior visit to OWNER GROUP at the current visit. If the OWNER GROUP recorded at the previous inventory (i.e., PREVIOUS OWNER GROUP) was coded incorrectly use codes 10 through 40 to correct the downloaded code (indicating an error was made at the previous visit). This code is only updateable when PREVIOUS DATA CORRECTABLE = Y. An update to this field requires an explanatory note in the electronic CONDITION CLASS NOTES.

When collected:	Downloaded when SAMPLE KIND = 2	
Field width:	2 digits	
Tolerance:	No errors	
Value:	Code	Description
	10	PREVIOUS OWNER GROUP should be 10 (Forest Service)
	20	PREVIOUS OWNER GROUP should be 20 (Other Federal)
	30	PREVIOUS OWNER GROUP should be 30 (State and Local)
	40	PREVIOUS OWNER GROUP should be 40 (Private)

Item 5.7.1.7 OWNER GROUP RECONCILE CODE (PNW)
[CHANGE_MATRIX_PNWRS.OWNGRPCD_RECONCILE]

Record a code indicating which type of change to OWNER GROUP occurred. When PREVIOUS DATA CORRECTABLE = Y only physical or procedural change codes are valid. When PREVIOUS DATA CORRECTABLE = N all three codes are valid. If a change occurred, a CHANGE MATRIX NOTE must be recorded to describe what the change is (e.g., new road construction).

When collected:	When SAMPLE KIND = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Change
	0	No change (reconciled by data recorder, not a valid code for field crew)
	1	Physical change
	2	Previous crew error
	3	Procedural change

Item 5.7.1.8 OWNER GROUP PROCEDURAL CHANGE REASON CODE (PNW)
[CHANGE_MATRIX_PNWRS.OWN_GRPCD_PRCD_CHNG_REASN_CD]

Record a code indicating which procedural change occurred. Use code 99 (other) only if the procedural change defined in code 01 does not apply.

When collected:	OWNER GROUP RECONCILE CODE = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	01	Administered, but not owned by the Forest Service (see table 5.1)
	99	Other (explanatory CHANGE MATRIX NOTES required)

Item 5.7.1.9 FOREST TYPE (CORE 2.5.3)
[COND.FLDTYPCD]

Record the code corresponding to the FOREST TYPE (see Appendix E, Forest Type Codes) that best describes the species with the plurality of stocking for all live trees in the Area of Observation that are not overtopped. Ignore inclusions and "visually" replace the area lost to inclusions with the FOREST TYPE of the immediate surrounding area within, and adjacent to, the AOO. Note: Canopy cover is used to determine whether an area is forest or nonforest. Stocking is used with other variables such as this one.

If STAND SIZE CLASS is nonstocked, then FOREST TYPE is determined by the following hierarchy:

For SAMPLE KIND = 2 plots, record the FOREST TYPE of the condition at the previous inventory.

For all other plots:

1. Evaluate any seedlings available to determine the FOREST TYPE.
2. If no seedlings exist, use adjacent stands and your best professional judgment to determine FOREST TYPE.

The instructions in Section 5.1, Determination of Condition Class and Section 5.5, Condition Class Attributes apply when delineating, within accessible forest land, contrasting conditions based on differences in FOREST TYPE.

When collected:	All accessible forestland condition classes (CONDITION CLASS STATUS = 1)
Field width:	3 digits
Tolerance:	No errors in group or type
Values:	See Appendix E, Forest Type Codes

Item 5.7.1.10 PREVIOUS FOREST TYPE (PNW)
[PREV_COND_PNWRS.FLDTYPCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS FOREST TYPE must be added. If added, record the code corresponding to the FOREST TYPE that best describes the species with the plurality of stocking for all live trees in the condition class that were not overtopped at the previous measurement.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	3 digits
Tolerance:	No errors in group, 100 percent of the time; no errors in type, at least 95 percent of the time
Values:	See Appendix E, Forest Type Codes

Item 5.7.1.11 STAND SIZE CLASS (CORE 2.5.4)
[COND.FLDSZCD]

Record the code that best describes the predominant size class of all live trees, seedlings, and saplings within the Area of Observation while ignoring inclusions. "Visually" replace the area lost to inclusions with the STAND SIZE CLASS of the immediate surrounding area within, and or adjacent to, the AOO. Note: Canopy cover is used to determine whether an area is forest or nonforest. Stocking is used with other variables such as this one.

The instructions in Section 5.1 and Section 5.5 apply when delineating, on accessible forest land, contrasting conditions based on differences in STAND SIZE CLASS.

Within the sampled area on a microplot, subplot, or macroplot, recognize only very obvious contrasting stands of different mean diameter with an abrupt boundary. Example: an obvious abrupt boundary exists within the sampled (fixed-radius) area of a subplot and demarcates a STAND SIZE CLASS change. *When in doubt, do not split conditions.* Use tree stocking of all live trees, seedlings, and saplings that are not overtopped to differentiate between stand-size classes.

When collected:	All accessible forestland condition classes (CONDITION CLASS STATUS = 1)		
Field width:	1 digit		
Tolerance:	No errors		
Values:	Code	Stand Size Class	Definition
	0	Nonstocked	Meeting the definition of accessible forest land, and the following applies: Less than 10 percent stocked by trees, seedlings, and saplings, and not classified as cover trees or 10 percent canopy cover if stocking standards are not available.
	1	≤ 4.9 inches (seedling, sapling)	At least 10 percent stocking in trees, seedling or saplings; and at least 2/3 of the canopy cover is in trees less than 5.0 inches DBH/DRC.
	2	5.0 - 8.9 inches (softwoods and woodland trees) 5.0 - 10.9 inches (hardwoods)	At least 10 percent stocking in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than or equal to 5.0 inches DBH/DRC and the plurality of the canopy cover is in softwoods between 5.0 - 8.9 inches diameter and/or hardwoods between 5.0 - 10.9 inches DBH, and/or woodland trees 5.0 - 8.9 inches DRC.
	3	9.0 - 19.9 inches (softwoods and woodland trees) 11.0 - 19.9 inches (hardwoods)	At least 10 percent stocking in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than or equal to 5.0 inches DBH/DRC and the plurality of the canopy cover is in softwoods between 9.0 - 19.9 inches diameter and/or hardwoods between 11.0 - 19.9 inches DBH, and for woodland trees 9.0 - 19.9 inches DRC.
	4	20.0 - 39.9 inches	At least 10 percent stocking in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than or equal to 5.0 inches DBH/DRC and the plurality of the canopy cover is in trees between 20.0 - 39.9 inches DBH.
	5	40.0 + inches	At least 10 percent stocking in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than or equal to 5.0 inches DBH/DRC and the plurality of the canopy cover is in trees ≥ 40.0 inches DBH.

Item 5.7.1.12 PREVIOUS STAND SIZE CLASS (PNW)
[PREV_COND_PNWRS.FLDSZCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS STAND SIZE CLASS must be added. If added, record the code that best describes the predominant size class of all live trees in the condition class that were not overtopped at the previous measurement.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	See Item 5.7.1.11, STAND SIZE CLASS (CORE 2.5.4)

Item 5.7.1.13 REGENERATION STATUS (CORE 2.5.5)
[COND.STDORGCD]

Record the code that best describes the artificial regeneration that occurred in the Area of Observation.

The instructions in Section 5.1, Determination of Condition Class and Section 5.3, Delineating Condition Classes Differing in Condition Class Status apply when delineating, within accessible forest land, contrasting conditions based on differences in REGENERATION STATUS.

For a forest land condition to be delineated and/or classified as artificially regenerated, the condition must show distinct evidence of planting or seeding. If it is difficult to determine whether or not a stand has been planted or seeded, then use code 0. If no distinct boundary exists within the sampled (fixed-radius) area on any subplot*/macroplot*, then do not recognize separate conditions. In many regions of the West, trees are not planted in rows, and planted stands do not differ in physical appearance from natural conditions. In these cases, there is no need to differentiate conditions based on regeneration status.

Note: Plot records or verbal evidence from landowner *are* acceptable *criteria* for determining regeneration status.

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1)		
Field width:	1 digit		
Tolerance:	No errors		
Values:	Code	Regeneration	Description
	0	Natural	Present stand shows no clear evidence of artificial regeneration. Includes unplanted, recently cut lands.
	1	Artificial	Present stand shows clear evidence of artificial regeneration. Do not include planted trees that have died, or pockets of planted trees that are less than 120 feet wide and an acre in size.

Item 5.7.1.14 PREVIOUS REGENERATION STATUS (PNW)
[PREV_COND_PNWRS.STDORGCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS REGENERATION STATUS must be added. If added, record the code that best describes the degree of evidence of artificial regeneration which occurred in the condition at the previous measurement.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	See Item 5.7.1.13, REGENERATION STATUS (CORE 2.5.5)

Item 5.7.1.15 TREE DENSITY (CORE 2.5.6)
[COND.MAPDEN]

Record a code to indicate the relative tree density classification. Base the classification on the number of stems/unit area, basal area, tree cover, or stocking of all live trees, seedlings, and saplings in the Area of Observation that are not overtopped, compared to any *other* condition class TREE DENSITY *recorded on the plot*. Ignore inclusions and "visually" replace the area lost to inclusions with the TREE DENSITY of the immediate surrounding area within, and or adjacent to, the AOO.

The instructions in Section 5.1, Determination of Condition Class and Section 5.4, Delineating Condition Classes Within Accessible Forest Land apply when delineating, within accessible forest land, contrasting conditions based on differences in TREE DENSITY.

Codes 2 and higher are used ONLY when all other attributes used to delineate separate condition classes are homogenous, i.e., when a change in density is the ONLY difference within what would otherwise be treated as only one forest condition. Otherwise, code 1 for all condition classes. Codes 2 and higher are usually, but not always, used to demarcate areas that differ from an adjacent area due to forest disturbance, e.g., a partial harvest or heavy, but not total tree mortality due to a ground fire. Delineation by density should only be done when the less-dense condition is 50 percent or less as dense as the more dense condition.

Do not distinguish between low-stocked/low canopy cover stands or stands of sparse and patchy forest.

In order to qualify as a separate condition based on density, there MUST be a distinct, easily observed change in the density of an area's tree cover or basal area.

Examples of valid contrasting conditions defined by differences in tree density are:

- the eastern half of an otherwise homogeneous, 20-acre stand has many trees killed by a bark beetle outbreak
- one portion of a stand is partially cut over (with 40 square feet basal area per acre) while the other portion is undisturbed (with 100 square feet basal area per acre)

Note: In these examples, RESERVED STATUS, OWNER GROUP, FOREST TYPE, STAND SIZE CLASS, and REGENERATION STATUS are the same.

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1)	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Initial density class
	2	Density class 2 - density different than 1
	3	Density class 3 - density different than 1 and 2

Item 5.7.1.16 PREVIOUS TREE DENSITY (PNW)
[PREV_COND_PNWRS.MAPDEN]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS TREE DENSITY must be added. If added, record a code to indicate the relative tree density classification at the previous measurement.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	See Item 5.7.1.15, TREE DENSITY (CORE 2.5.6)

SUBSECTION 5.7.2 ANCILLARY (NON-DELINEATING) DATA ITEMS

Item 5.7.2.1 OWNER CLASS (CORE OPTIONAL 2.5.7)
[COND.OWNCD_PNWRS]

Record the OWNER CLASS code that best corresponds to the ownership of the land in the condition class. Conditions will NOT be delineated based on changes in OWNER CLASS. If multiple OWNER CLASSes occur within a condition class (i.e., within an OWNER GROUP) record the OWNER CLASS closest to the center of the lowest numbered subplot in the condition's Area of Observation.

Note: When federal land is owned and administered by two separate entities (e.g., BLM and Forest Service), this data item records the legal owner of the land, not the administrator.The value for this field should be downloaded for condition class 1 and indicates the owner classification for subplot 1 center (the pinpricked field grid location). However, check to be sure the value is correct for the plot and update this code if incorrect. If the difference is due to a change in ownership since the last field visit, record the date of the ownership change (if known), and make a note in CONDITION CLASS NOTES (Item 5.10.1.2).

When collected:	All condition classes		
Field width:	2 digits		
Tolerance:	No errors		
Values:	Code	Description	Core code (office use only)
	Owner Classes within Forest Service lands (OWNER GROUP = 10):		
	11	National Forest	11
	12	National Grassland and/or Prairie	12
	13	Other Forest Service land	13
	Owner Classes within Other Federal lands (OWNER GROUP = 20):		
	21	National Park Service	21
	22	Bureau of Land Management	22
	23	Fish and Wildlife Service	23
	24	Departments of Defense/Energy	24
	25	Other Federal	25
	Owner Classes within State and Local Government lands (OWNER GROUP = 30):		
	31	State including state public universities	31
	32	Local (County, Municipality, etc.) including water authorities	32
	33	Other Non Federal Public	33
	Owner Classes within Private lands (OWNER GROUP = 40):		
	41	Corporate, including Native Corporations in Alaska and private educational institutions (including private universities). Owner names that include Inc. or Corp. are considered corporate by law so will be coded under OWNER CLASS = 41 (Rare exceptions are described in OWNER CLASS = 43 and 45.)	41
	42	Non Governmental Conservation / Natural Resources Organization – Examples: Nature Conservancy, National Trust for Private Lands, Pacific Forest Trust, Boy Scouts of America, etc.	42
	43	Unincorporated Partnerships / Associations / Clubs. Examples: Hunting Clubs that own, not lease property, recreation associations, 4H, churches etc. (Although rare, LLCs and LLPs that are associated with a Partnership, Association, or Club are coded under OWNER CLASS = 43.)	43
	44	Native American (Indian) - within reservation boundaries	44
	45	Individual and Family, including trusts, estates, and family partnerships. (Although rare, LLCs and LLPs that are associated directly with a family, such as the Jones Family LLC, are coded under OWNER CLASS = 45. In the absence of any indication that the LLC or LLP is tied to a family, code as OWNER CLASS = 41.)	45

Item 5.7.2.2 PREVIOUS OWNER CLASS (PNW)
[PREV_COND_PNWRS.OWNCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous condition is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS OWNER CLASS must be added. If added, record the OWNER CLASS code that best corresponds to the ownership of the land in the condition class at the previous measurement. Note: PREVIOUS OWNER CLASS values have already been updated to current codes.

When collected:	When SAMPLE KIND = 2
Field width:	2 digits
Tolerance:	No errors
Values:	See OWNER CLASS

Item 5.7.2.3 RESERVED AREA NAME (CORE 2.5.12)
[COND.RESERVED_AREA_NAME]

Record the specific name of the area that identifies the reserved designation for the condition. This will be downloaded for CONDITION CLASS NUMBER 1 and should be verified; for all other conditions, select from the drop-down list in the PDR or type in the correct name.

When collected:	All conditions with RESERVED STATUS = 1
Field width:	Alphanumeric character field
Tolerance:	No errors
Values:	English language words, phrases and numbers

Item 5.7.2.4 ADMINISTRATIVE FOREST CODE (AFSL, PFSL)
[COND.ADFORCD]

Downloaded code identifying the administrative unit (Forest Service region and national forest/grassland/ management unit) in which the condition is located. The first two digits of the four digit code are for the region number and the last two are for the administered national forest number. Verify the downloaded code; update if incorrect.

Note: For federal land owned by one entity (e.g., BLM) and administered (managed) by another entity (e.g., Siskiyou National Forest), the ADMINISTRATIVE FOREST CODE of the administrating unit is recorded (0611 - Siskiyou NF in this example). Additional measurements are taken when a condition class is located on R5 or R6 Forest Service administered lands (ADMINISTRATIVE FOREST CODE = 501-699); this includes other federal lands (OWNER GROUP = 20) administered by R5 or R6 Forest Service units. The PDR will generate a warning when this situation exists; crews must verify that ownership and administrating unit are indeed different (i.e., owner and administrator are separate entities).

When collected:	Downloaded for all accessible forest land condition classes (CONDITION CLASS STATUS = 1) and nonforest land condition classes (CONDITION CLASS STATUS = 2 or 5) located on Forest Service administered lands (OWNER GROUP = 10 or 20)			
Field width:	4 digits			
Tolerance:	No errors			
Values:	0104	Idaho Panhandle National Forest	0602	Fremont National Forest
	0417	Toiyabe National Forest	0603	Gifford Pinchot National Forest
	0501	Angeles National Forest	0604	Malheur National Forest
	0502	Cleveland National Forest	0605	Mt. Baker Snoqualmie National Forest
	0503	Eldorado National Forest	0606	Mt. Hood National Forest
	0504	Inyo National Forest	0607	Ochoco National Forest
	0505	Klamath National Forest	0608	Okanogan National Forest
	0506	Lassen National Forest	0609	Olympic National Forest
	0507	Los Padres National Forest	0610	Rogue River National Forest
	0508	Mendocino National Forest	0611	Siskiyou National Forest
	0509	Modoc National Forest	0612	Siuslaw National Forest
	0510	Six Rivers National Forest	0614	Umatilla National Forest

	0511	Plumas National Forest	0615	Umpqua National Forest
	0512	San Bernardino National Forest	0616	Wallowa-Whitman Nat. Forest
	0513	Sequoia National Forest	0617	Wenatchee National Forest
	0514	Shasta-Trinity National Forest	0618	Willamette National Forest
	0515	Sierra National Forest	0620	Winema National Forest
	0516	Stanislaus National Forest	0621	Colville National Forest
	0517	Tahoe National Forest	0622	Columbia River Gorge NSA
	0519	Lake Tahoe Basin Mgmt. Unit	0650	Crooked River National Grassland
	0601	Deschutes National Forest	0000	Other federal land (OWNER GROUP = 20) not administered by the Forest Service

Item 5.7.2.5 PREVIOUS ADMINISTRATIVE FOREST CODE (AFSL, PFSL)
[PREV_COND_PNWRS.ADFORCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous CONDITION CLASS STATUS = 1, 2, or 5 condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP located on Forest Service administered lands, a PREVIOUS ADMINISTRATIVE FOREST CODE must be added. Note: PREVIOUS ADMINISTRATIVE FOREST CODE values have already been updated to current codes.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION STATUS = 1, 2, or 5 and located on Forest Service administered lands (PREVIOUS OWNER GROUP = 10 or 20)
Field width:	4 digits
Tolerance:	No errors
Values:	See ADMINISTRATIVE FOREST CODE

Item 5.7.2.6 ARTIFICIAL REGENERATION SPECIES (CORE 2.5.13)
[COND.STDORGSP]

<u>Record the species code of the predominant tree species for which evidence exists of artificial regeneration within the Area of Observation of the REGENERATION STATUS delineated condition. This attribute is ancillary; that is, contrasting condition classes are never delineated based on variation in this attribute.</u>

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1) with evidence of artificial regeneration (REGENERATION STATUS = 1)
Field width:	4 digits
Tolerance:	No errors
Values:	See APPENDIX D, FIA Tree Species Codes

Item 5.7.2.7 PREVIOUS ARTIFICIAL REGENERATION SPECIES (PNW)
[PREV_COND_PNWRS.STDORGSP]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, and PREVIOUS REGENERATION STATUS = 1, a PREVIOUS ARTIFICIAL REGENERATION SPECIES must be added. If added, record the species code of the predominant tree species for which evidence existed of artificial regeneration in the stand at the previous measurement.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1 and PREVIOUS REGENERATION STATUS = 1
Field width:	3 digits
Tolerance:	No errors
Values:	See APPENDIX D, FIA Tree Species Codes

Item 5.7.2.8 AGE BASIS CODE (AFSL, PFSL)
[COND.AGE_BASIS_CD_PNWRS]

Record the code that indicates the method used to determine STAND AGE (Item 5.7.2.9).

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1)		
Field width:	2 digits		
Tolerance:	No errors		
Values:	Code	Description	Stand Age (office use only)
	00	Stand is nonstocked	STAND AGE = 000
	10	Weighted average of trees bored for age (on macroplot)	n/a
	11	Weighted average of trees bored for age (off macroplot)	n/a
	20	Whorl counted only (on or off macroplot)	n/a
	30	Mixed method of whorl-count and/or bored age (on or off macroplot)	n/a
	40	Time since last inventory - years added to previously recorded stand age	n/a
	50	Age based on documentary evidence or landowner discussion	n/a
	51	Age based on crew call considering site and tree diameters	n/a
	60	All trees in the condition are of a species or size which cannot be bored	STAND AGE = 998
	70	Tree cores not dated in the field, but taken to office or lab for dating	STAND AGE = 999
	80	STAND AGE >997 years	STAND AGE = 997

Item 5.7.2.9 STAND AGE (CORE 2.5.14)
[COND.FLDAGE]

Record the average total age, to the nearest year, of the *overstory* trees (plurality of all live trees, seedlings, and saplings not overtopped) in the predominant STAND SIZE CLASS of the condition within the Area of Observation, determined using local procedures. Record *"000"* for non-stocked stands. Note: Canopy cover is used to determine whether an area is forest or nonforest. Stocking is used with other variables such as this one.

An estimate of STAND AGE is required for every forest land condition class defined on a plot. Stand age is usually highly correlated with STAND SIZE CLASS within the Area of Observation and should reflect the average age of all trees that are not overtopped. Unlike the procedure for site tree age (TREE AGE AT DIAMETER), estimates of STAND AGE should estimate the time of tree establishment (*i.e.*, not age at the point of diameter measurement). Note: For planted stands, estimate age based on the year the stand was planted (*i.e.*, do not add in the age of the planting stock).

On re-measurement plots (SAMPLE KIND = 2), where a PREVIOUS STAND AGE exists for a condition, STAND AGE should be calculated by adding years since the previous inventory (AGE BASIS CODE =40) if the previously aged trees are still representative of the current STAND SIZE CLASS.

However, if the trees used to determine PREVIOUS STAND AGE are not representative of the current STAND SIZE CLASS, determine a new STAND AGE and use the appropriate AGE BASIS CODE.

To estimate STAND AGE, select two or three dominant or codominant trees from the overstory. If the overstory covers a wide range of tree sizes and species, try to select the trees accordingly but it is not necessary to core additional trees in such stands. Core each tree *just below* the point of diameter measurement and count the rings between the outside edge and the core to the pith. Add in the number of years that passed from germination until the tree reached the point of core extraction to determine the total age of the tree *(use the guidelines below and adjust as needed for site variation and observed growth rates)*.

General regional guidelines for converting breast height age to total age by species, years to add:

west side: conifers + 5, hardwoods + 4

east side: conifers + 8, hardwoods + 5

The field crew should use their best judgment in estimating a STAND AGE by taking the average total age of the predominant overstory trees in the stand, using tree ages for guidance. For example, if three trees aged 34, 62, and 59 years represent 25 percent, 60 percent, and 15 percent of the overstory, respectively, the weighted stand age *would* be:

(34 x 0.25) + (62 x 0.60) + (59 x 0.15) = 55 years

In some cases, it may be possible to avoid coring trees to determine age. If a stand has not been seriously disturbed since the previous survey, simply add the number of years since the previous inventory to the previous STAND AGE. In other situations, cores collected from site trees can be used to estimate STAND AGE *when they are representative of the overstory*.

For seedling/sapling sized forested conditions count the number of whorls or branch nodes to help in getting an estimate. Determine age by whorl count for the following species only: Douglas-fir; pines; and true firs. This is only an acceptable practice in young, fast-growing stands (e.g., plantations, regenerating clearcuts); it is almost never acceptable where the environment limits vigorous tree growth (e.g., subalpine areas, bogs).

If all of the trees in *the overstory* are of a species which, by regional standards, cannot be bored for age (e.g., *black oak, Pacific madrone) examine ancillary information to provide a stand age (see Subsection 8.7.1, Tree Age for list of species that regionally are restricted from being bored for age).*

Use ancillary information that provides clues about STAND AGE, such as planting date estimates offered by the landowner and disturbance dates implied by perusal of multi-date aerial imagery. If estimated age can be determined for hardwoods not bored (for example, counting rings on a nearby stump) then use this information to estimate STAND AGE.

When collected:	*When AGE BASIS CODE < 60*
Field width:	*4* digits
Tolerance:	+/- 10 percent
Values:	000 to *999*

Item 5.7.2.10 PREVIOUS STAND AGE (PNW)
[PREV_COND_PNWRS.FLDAGE]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS STAND AGE must be added. If added, record the average total age, to the nearest year, of the trees (plurality of all live trees not overtopped) in the predominant STAND SIZE CLASS of the condition at the previous measurement, determined using local procedures. Record 000 for previously nonstocked stands.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	4 digits
Tolerance:	+/- 10 percent
Values:	Null, 000 to 999

Item 5.7.2.11 PHYSIOGRAPHIC CLASS (CORE 2.5.27)
[COND.PHYSCLCD]

Record the code that best describes the PHYSIOGRAPHIC CLASS of the condition within the Area of Observation; land form, topographic position, and soil generally determine physiographic class. Once PHYSIOGRAPHIC CLASS has been determined to be Xeric, Mesic, or Hydric, it is permissible to look at the characteristics of the surrounding landscape to assign the associated code within each grouping if it is not obvious within the Area of Observation. Unless there was an obvious error made at the previous visit, do not change the PHYSIOGRAPHIC CLASS.

When collected:	All measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)
Field width:	2 digits
Tolerance:	No errors
Values:	Xeric - Sites that are normally low or deficient in moisture available to support vigorous tree growth. These areas may receive adequate precipitation, but experience a rapid loss of available moisture due to runoff, percolation, evaporation, etc.

11	Dry Tops	Ridge tops with thin rock outcrops and considerable exposure to sun and wind.
12	Dry Slopes	Slopes with thin rock outcrops and considerable exposure to sun and wind. Includes most mountain/steep slopes with a southern or western exposure.
13	Deep Sands	Sites with a deep, sandy surface subject to rapid loss of moisture following precipitation. Typical examples include sand hills, sites along the beach and shores of lakes and streams and many deserts.
19	Other Xeric	All dry physiographic sites not described above. *Describe in electronic CONDITION CLASS NOTES.*
Mesic - Sites that have moderate but adequate moisture available to support vigorous tree growth except for periods of extended drought. These sites may be subjected to occasional flooding during periods of heavy or extended precipitation.		
21	Flatwoods	Flat or fairly level sites outside flood plains. Excludes deep sands and wet, swampy sites.
22	Rolling Uplands	Hills and gently rolling, undulating terrain and associated small streams. Excludes deep sands, all hydric sites, and streams with associated floodplains.
23	Moist Slopes and Coves	Moist slopes and coves with relatively deep, fertile soils. Often these sites have a northern or eastern exposure and are partially shielded from wind and sun. Includes moist mountain tops and saddles.
24	Narrow Floodplains/ Bottomlands	Flood plains and bottomlands less than 1/4-mile in width along rivers and streams. These sites are normally well drained but are subjected to occasional flooding during periods of heavy or extended precipitation. Includes associated levees, benches, and terraces within a 1/4 mile limit. Excludes swamps, sloughs, and bogs
25	Broad Floodplains	Flood plains and bottomlands 1/4 mile or wider in width along rivers and streams. These sites are normally well drained but are subjected to occasional flooding during periods of heavy or extended precipitation. Includes associated levees, benches, and terraces. Excludes swamps, sloughs, and bogs with year-round water problems.
29	Other Mesic	All moderately moist physiographic sites not described above. *Describe in electronic CONDITION CLASS NOTES.*
Hydric - Sites that generally have a year-round abundance or over-abundance of moisture. Hydric sites are very wet sites where excess water seriously limits both growth and species occurrence.		
31	Swamps/Bogs	Low, wet, flat forested areas usually quite extensive that are flooded for long periods of time except during periods of extreme drought. Excludes cypress ponds and small drains.
32	Small Drains	Narrow, stream-like, wet strands of forest land often without a well-defined stream channel. These areas are poorly drained or flooded throughout most of the year and drain the adjacent higher ground.
33	Bays and Wet Pocosins	Low, wet, boggy sites characterized by peaty or organic soils. May be somewhat dry during periods of extended drought. Examples include the Carolina bays in the southeast US.
34	Beaver Ponds	
35	Cypress Ponds	
36	Forest or Nonforest over Permafrost	Low-lying, sometimes wet, flat areas, often characterized by a thick moss layered ground surface, sometimes comprised of tussocks that tend to form a waterlogged soils layer as the active layer thaws seasonally. Permafrost may be visible or detected with a soil probe. At later periods in the season when permafrost cannot be detected, waterlogged soils layered on top of deeper permafrost are possible.
39	Other Hydric	All other hydric physiographic sites *Describe in electronic CONDITION CLASS NOTES.*

Item 5.7.2.12 PREVIOUS PHYSIOGRAPHIC CLASS (PNW)
[PREV_COND_PNWRS.PHYSCLCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS PHYSIOGRAPHIC CLASS must be added. If added, record the code that best describes the PHYSIOGRAPHIC CLASS of the condition at the previous measurement; land form, topographic position, and soil generally determine physiographic class.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1; or PREVIOUS CONDITION CLASS STATUS = 2 and ADFORCD = 500 - 699
Field width:	2 digits
Tolerance:	No errors
Values:	See Item 5.7.2.11, PHYSIOGRAPHIC CLASS (CORE 2.5.27) excluding code 36, added in 2020

Item 5.7.2.13 CURRENT GROUND LAND CLASS (PFSL)
[COND.GROUND_LAND_CLASS_PNW]

Record the 3-digit code that corresponds to the best ground land class (GLC) description listed below, within the Area of Observation. GLC should be collected on all accessible and nonsampled forest lands. When SAMPLE KIND = 2 (remeasured plot), previous GLC will be downloaded (in the CURRENT GROUND LAND CLASS field) for all accessible forest land condition classes.

For entirely nonsampled plots: If multiple condition classes would be delineated if ground visited, assess GLC of the forested/potentially forested condition class (that would be delineated if ground visited) with the majority of area on the plot footprint using current and historical imagery, previous data, and local knowledge.

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1); and all nonsampled forest land condition classes (CONDITION CLASS STATUS = 5)		
Field width:	3 digits		
Tolerance:	No errors		
Values:	Code	GLC	Description
	120	Timberland	Forest land which is potentially capable of producing at least 20 cubic feet/acre/year at culmination in fully stocked, natural stands (1.4 cubic meters/hectares/year) of continuous crops of trees to industrial roundwood size and quality. Industrial roundwood requires species that grow to size and quality adequate to produce lumber and other manufactured products (exclude fence posts and fuel wood which are not considered manufactured). Timberland is characterized by no severe limitations on artificial or natural restocking with species capable of producing industrial roundwood.
	141	Other forest-rocky	Other forest land which can produce tree species of industrial roundwood size and quality, but which is unmanageable because the site is steep, hazardous, and rocky, or is predominantly nonstockable rock or bedrock, with trees growing in cracks and pockets. Other forest-rocky sites may be incapable of growing continuous crops due to inability to obtain adequate regeneration success.
	142	Other forest-unsuitable site (wetland, subalpine or coastal conifer scrub) (CA only)	Other forest land which is unsuited for growing industrial roundwood because of one of the following environment factors: willow bogs, spruce bogs, sites with high water tables or even standing water for a portion of the year, and harsh sites due to extreme climatic and soil conditions. Trees present are often extremely slow growing and deformed. Examples: whitebark pine, lodgepole, or mountain hemlock stands at timberline; shore pine along the Pacific Ocean (Monterey, Bishop, and Douglas-Fir); willow wetlands with occasional cottonwoods present; Sitka spruce-shrub communities bordering tidal flats and channels along the coast. Includes aspen stands in high-desert areas.
	143	Other forest-pinyon-juniper	Areas currently capable of 10 percent or more tree stocking with forest trees, with juniper species predominating. These areas are not now, and show no evidence of ever having been, 10 percent or more stocked with trees of industrial roundwood form and quality. Stocking capabilities indicated by live juniper trees or juniper stumps and juniper snags less than 25 years dead or cut.

	144	Other forest-oak (formally oak woodland)	Areas currently 10 percent or more stocked with forest trees, with low quality forest trees of oak, gray pine, madrone, or other hardwood species predominating, and which are not now, and show no evidence of ever having been, 10 percent or more stocked with trees of industrial roundwood form and quality. Trees on these sites are usually short, slow growing, gnarled, poorly formed, and generally suitable only for fuel wood. The following types are included: blue oak, white oak, live oak, oak-gray pine.
	146	(OR & WA only) Other forest-unsuitable site	Other forest land which is unsuited for growing industrial roundwood because of one of the following environment factors: willow bogs, spruce bogs, sites with high water tables or even standing water for a portion of the year, and harsh sites due to climatic conditions. Trees present are often extremely slow growing and deformed. Examples: whitebark pine or mountain hemlock stands at timberline, shore pine along the Pacific Ocean, willow wetlands with occasional cottonwoods present, and sitka spruce-shrub communities bordering tidal flats and channels along the coast. Aspen stands in high-desert areas are considered other forest-unsuitable site.
	148	Other forest-cypress (CA only)	Forest land with forest trees with cypress predominating. Shows no evidence of having had 10 percent or more cover of trees of industrial roundwood quality and species.
	149	Other forest-low productivity (office use only)	(this code will be calculated in the office; field crews should never use this code)Forest land capable of growing crops of trees to industrial roundwood quality, but not able to grow wood at the rate of 20 cubic feet/acre/year. Included are areas of low stocking potential and/or very low site index.

Item 5.7.2.14 PREVIOUS GROUND LAND CLASS (PFSL)
[PREV_COND_PNWRS.GROUND_LAND_CLASS_PNW]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS GROUND LAND CLASS must be added. If added, record the code that corresponds to the best ground land class (GLC) description listed below.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	3 digits
Tolerance:	No errors
Values:	See Item 5.7.2.13, CURRENT GROUND LAND CLASS (PFSL)

Item 5.7.2.15 SOIL DEPTH (PFSL)
[COND.SOIL_ROOTING_DEPTH_PNW]

Record a code to describe SOIL DEPTH (the depth to which tree roots can penetrate) within each forest land condition class Area of Observation. Required for all forest condition classes. Code this item "1" when more than half of area in the condition class is estimated to be less than 20 inches deep. Ground pumice, decomposed granite, and sand all qualify as types of soil. Use clues such as abundance of rock outcrops, root wads, and soil depth on cutbanks to make the estimate.

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1)	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	≤ 20 inches
	2	> 20 inches

Item 5.7.2.16 PREVIOUS SOIL DEPTH (PFSL)
[PREV_COND_PNWRS.SOIL_ROOTING_DEPTH_PNW]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS SOIL DEPTH must be added. This item describes soil depth within each forest land condition class at the previous measurement.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	See SOIL DEPTH

Item 5.7.2.17 CONDITION FUELBED TYPE (OPTIONAL 2.6.1)
[COND.P2DWM_FUELBED_TYPCD]

<u>Record the fuelbed code from the Scott and Burgan (2005; RMRS-GTR-153) fuel model guide that best corresponds with the combined fire behavior characteristics of live and dead materials on and near the ground surface within the Area of Observation. The visual appearance of the condition on the plot is not as important as the amount and packing density of live and dead fuels of different sizes. Refer to fuelbed descriptions, keys, and photos in Scott and Burgan*(2005; RMRS-GTR-153)* to select the fuel model which best matches conditions on the condition class.</u> Use the following key for field reference. Oregon, Washington, and California are considered arid to semiarid; tropical climates are considered humid and subhumid. The humid and subhumid fuel types are not valid codes in Oregon, Washington, and California.

1. Nearly pure grass and/or forb type (Grass)
   a. Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 percent.
      i. **GR1** Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.
      ii. **GR2** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate.
      iii. **GR4** Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high; flame length high.
      iv. **GR7** Moderately coarse continuous grass, average depth about 3 feet. Spread rate very high; flame length very high.
2. Mixture of grass and shrub, up to about 50 percent shrub coverage (Grass- Shrub)
   a. Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 percent.
      i. **GS1** Shrubs are about 1 foot high, low grass load. Spread rate moderate; flame length low.
      ii. **GS2** Shrubs are 1 to 3 feet high, moderate grass load. Spread rate high; flame length moderate.
3. Shrubs cover at least 50 percent of the site; grass sparse to nonexistent (Shrub)
   a. Arid to semiarid climate (rainfall deficient in summer). Extinction moisture content is 15 percent.
      i. **SH1** Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low; flame length very low.
      ii. **SH2** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuel present. Spread rate low; flame length low.
      iii. **SH5** Heavy shrub load, depth 4 to 6 feet. Spread rate very high; flame length very high.
      iv. **SH7** Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH5, but flame length similar. Spread rate high; flame length very high.
4. Grass or shrubs mixed with litter from forest canopy (Timber-Understory)
   a. Semiarid to subhumid climate. Extinction moisture content is 20 percent.
      i. **TU1** Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.
      ii. **TU4** Fuelbed is short conifer trees with grass or moss understory. Spread rate moderate; flame length moderate.
      iii. **TU5** Fuelbed is high load conifer litter with shrub understory. Spread rate moderate; flame length moderate.
5. Dead and down woody fuel (litter) beneath a forest canopy (Timber Litter)

a. Fuelbed is recently burned but able to carry wildland fire.
   i. **TL1** Light to moderate load, fuels 1 to 2 inches deep. Spread rate very low; flame length very low.
b. Fuelbed not recently burned.
   i. Fuelbed composed of broadleaf (hardwood) litter.
      1. **TL2** Low load, compact. Spread rate very low; flame length very low.
      2. **TL6** Moderate load, less compact. Spread rate moderate; flame length low.
      3. **TL9** Very high load, fluffy. Spread rate moderate; flame length moderate.
   ii. Fuelbed composed of long-needle pine litter.
      1. **TL8** moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.
   iii. Fuelbed not composed broadleaf or long-needle pine litter.
      1. Fuelbed includes both fine and coarse fuels.
         a. **TL4** Moderate load, includes small diameter downed logs. Spread rate low; flame length low.
         b. **TL7** Heavy load, includes larger diameter downed logs. Spread rate low; flame length low.
      2. Fuelbed does not include coarse fuels.
         a. **TL3** Moderate load conifer litter. Spread rate very low; flame length low.
         b. **TL5** High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.
         c. **TL9** Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate.

6. Activity fuel (slash) or debris from wind damage (blowdown) (Slash-Blowdown)
   a. Fuelbed is activity fuel.
      i. **SB1** Fine fuel load is 10 to 20 tons/acre, weighted toward fuels 1 to 3 inches diameter class, depth is less than 1 foot. Spread rate moderate; flame length low.
      ii. **SB2** Fine fuel load is 7 to 12 tons/acre, evenly distributed across 0 to 0.25, 0.25 to 1, and 1 to 3 inch diameter classes, depth is about 1 foot. Spread rate moderate; flame length moderate.
      iii. **SB3** Fine fuel load is 7 to 12 tons/acre, weighted toward 0 to 0.25 inch diameter class, depth is more than 1 foot. Spread rate high; flame length high.
   b. Fuelbed is blowdown.
      i. **SB2** Blowdown is scattered, with many trees still standing. Spread rate moderate; flame length moderate.
      ii. **SB3** Blowdown is moderate, trees compacted to near the ground. Spread rate high; flame length high.
      iii. **SB4** Blowdown is total, fuelbed not compacted, foliage still attached. Spread rate very high; flame length very high.
7. Insufficient wildland fuel to carry wildland fire under any condition (Nonburnable)
   a. **NB1** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
   b. **NB2** Snow/ice.
   c. **NB3** Agricultural field, maintained in nonburnable condition.
   d. **NB8** Open water.
   e. **NB9** Bare ground.

When collected:	All conditions where DWM SAMPLING STATUS >0	
Field width:	3 alpha-numeric characters	
Tolerance:	+/- 1 class within a type	
Values:	GR1	Short, Sparse Dry Climate Grass
	GR2	Low Load, Dry Climate Grass
	GR4	Moderate Load, Dry Climate Grass
	GR7	High Load, Dry Climate Grass
	GS1	Low Load, Dry Climate Grass-Shrub
	GS2	Moderate Load, Dry Climate Grass-Shrub
	SB1	Slash-Blowdown: Low Load Activity Fuel

	SB2	Moderate Load Activity Fuel or Low Load Blowdown
	SB3	High Load Activity Fuel or Moderate Load Blowdown
	SB4	High Load Blowdown
	SH1	Low Load Dry Climate Shrub
	SH2	Moderate Load Dry Climate Shrub
	SH5	High Load, Dry Climate Shrub
	SH7	Very High Load, Dry Climate Shrub
	TL1	Low Load Compact Conifer Litter
	TL2	Low Load Broadleaf Litter
	TL3	Moderate Load Conifer Litter
	TL4	Small downed logs
	TL5	High Load Conifer Litter
	TL6	Moderate Load Broadleaf Litter
	TL7	Large Downed Logs
	TL8	Long-Needle Litter
	TL9	Very High Load Broadleaf Litter
	TU1	Low Load Dry Climate Timber-Grass-Shrub
	TU4	Dwarf Conifer With Understory
	TU5	Very High Load, Dry Climate Timber-Shrub
	NB1	Nonburnable Urban/developed
	NB2	Nonburnable Snow/ice
	NB3	Nonburnable Agricultural
	NB8	Nonburnable Open water
	NB9	Nonburnable Bare ground

Item 5.7.2.18 STAND STRUCTURE (PFSL)
[COND.STND_STRUC_CD_PNWRS]

Record the code that best represents the overall structure of the stand within the Area of Observation. A related CONDITION CLASS NOTE is required when correcting a previous crew error.

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1)		
Field width:	1 digit		
Tolerance:	No errors		
Values:	Code	Stand Structure	Description
	1	Even-aged single-storied	A single even canopy characterizes the stand. The greatest number of trees are in a height class represented by the average height of the stand; there are substantially fewer trees in height classes above and below this mean. The smaller trees are usually tall spindly members that have fallen behind their associates. The ages of the trees usually do not differ by more than 20 years.
	2	Even-aged two-storied	Stands composed of two distinct canopy layers, such as an overstory with an understory sapling layer possibly due to seed tree and shelterwood operations. This composition may also be found in older plantations where shade-tolerant trees have become established. Two relatively even canopy levels can be recognized in the stand. Understory or overtopped trees are common. Neither canopy level is necessarily continuous or closed, but both canopy levels tend to be uniformly distributed across the stand. The average age of each level differs significantly from the other.
	3	Uneven-aged	Theoretically, these stands contain trees of every age on a continuum from seedlings to mature canopy trees. In practice, uneven-aged stands are characterized by a broken or uneven canopy layer. Usually the largest number of trees are in the smaller diameter classes. As trees increase in diameter, their numbers diminish throughout the stand. Many times, instead of producing a negative exponential distribution of diminishing larger diameters, uneven-aged stands behave irregularly with waves of reproduction and mortality. Consider any stand with 3 or more structural layers as uneven-aged. Some kinds of logging disturbances (for example, selection, diameter limit, and salvage cutting) will give a stand an uneven-aged structure.

	4	Mosaic	At least two distinct size classes are represented and these are not uniformly distributed but are grouped in small repeating aggregations, or occur as stringers less than 120 feet wide, throughout the stand. Each size class aggregation is too small to be recognized and mapped as an individual condition. The aggregations may or may not be even-aged.

Item 5.7.2.19 PREVIOUS STAND STRUCTURE (PFSL)
[PREV_COND_PNWRS.STND_STRUC_CD_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS STAND STRUCTURE must be added. This item describes the overall structure of the stand.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	See STAND STRUCTURE

Item 5.7.2.20 DISTURBANCE 1 (CORE 2.5.15)
[COND.DSTRBCD1]

Record the code corresponding to the presence of the following disturbances. Disturbance can connote positive or negative effects. The area affected by any natural or human-caused disturbance must be at least 1.0 acre in size. Record up to three different disturbances per condition class from most important to least important. This attribute is ancillary; that is, contrasting conditions are never delineated based on variation in this attribute.

For initial plot establishment (SAMPLE KIND = 1 or 3), the disturbance must be within the last 5 years. For remeasured plots *(SAMPLE KIND = 2)* recognize only those disturbances that have occurred since the previous inventory.

Disturbance codes require "significant threshold" damage, which implies mortality and/or damage to 25 percent of all trees in a stand or 50 percent of an individual species' count. Additionally, some disturbances affect land and/or vegetation, but initially may not affect vegetation growth or health (e.g., grazing, browsing, flooding). In these cases, a disturbance should be coded when at least 25 percent of the soil surface or understory vegetation has been affected.

Use the general disturbance codes (i.e., 10, 20, etc) only if one of the more specific codes (i.e., 41, 42, etc) does not apply. When coding fire (30), it is important to distinguish ground fire (31) from crown fire (32) where possible. Code “00” if no DISTURBANCE 1 is observed.

When collected:	All measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)			
Field width:	2 digits			
Tolerance:	No errors			
Values:	Code	Disturbance		Definition
	00	None		No observable disturbance
	10	Insect damage		
			11	Insect damage to understory vegetation
			12	Insect damage to trees, including seedlings and saplings
	20	Disease Damage		
			21	Disease damage to understory vegetation
			22	Disease *(including mistletoe)* damage to trees, including seedlings and saplings
	30	Fire		Crown or ground fire, either prescribed or natural
			31	Ground fire
			32	Crown fire
	40	Animal Damage		

		41	Beaver – Includes flooding caused by beaver
		42	Porcupine
		43	Deer/Ungulate
		44	Bear
		45	Rabbit
		46	Domestic animal or livestock – Includes grazing
	50	Weather	
		51	Ice
		52	Wind – Includes hurricane, tornado
		53	Flooding – weather induced
		54	Drought
	60	Vegetation	Suppression, competition, vines
	70	Unknown/ unsure/other	*Describe in electronic CONDITION CLASS NOTES*
	80	Human caused damage	Any significant threshold of human caused damage not described in the DISTURBANCE codes listed or in the TREATMENT codes listed. Must include *an electronic CONDITION CLASS NOTE* to describe further.
	90	Geological Disturbances	
		91	Landslide
		92	Avalanche Track
		93	Volcanic Blast Zone
		94	Other Geologic Event
		95	Earth movements/avalanches

Item 5.7.2.21 PREVIOUS DISTURBANCE 1 (PNW)
[PREV_COND_PNWRS.DSTRBCD1]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous disturbance must be added for the new condition. PREVIOUS DISTURBANCE codes have already been updated to the current codes.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	2 digits
Tolerance:	No errors
Values:	See DISTURBANCE 1

Item 5.7.2.22 DISTURBANCE YEAR 1 (CORE 2.5.16)
[COND.DSTRBYR1]

<u>Record the year in which DISTURBANCE 1 occurred. If the disturbance occurs continuously over a period of time, record 9999.</u>

When collected:	When DISTURBANCE 1 > 00
Field width:	4 digits
Tolerance:	+/- 1 year for measurement cycles of 5 years
	+/- 2 years for measurement cycles of > 5 years
Values:	*Year that is the same as or s*ince the previous *annual inventory* plot visit, or *within* the past 5 years for plots visited for the first time; 9999

Item 5.7.2.23 PREVIOUS DISTURBANCE YEAR 1 (PNW)
[PREV_COND_PNWRS.DSTRBYR1]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous disturbance year can be added for the new condition. If added, record the year in which PREVIOUS DISTURBANCE 1 occurred at the previous measurement. If the disturbance occurs continuously over a period of time, record 9999.

When collected:	When SAMPLE KIND = 2 and PREVIOUS DISTURBANCE 1 > 00
Field width:	4 digits
Tolerance:	No errors
Values:	Since the last periodic or within the 5 years prior to the first annual inventory, 9999

Item 5.7.2.24 DISTURBANCE 2 (CORE 2.5.17)
[COND.DSTRBCD2]

Record the second disturbance here. See DISTURBANCE 1 for coding instructions. Code “00” if no DISTURBANCE 2 is observed.

Item 5.7.2.25 PREVIOUS DISTURBANCE 2 (PNW)
[PREV_COND_PNWRS.DSTRBCD2]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous disturbance can be added for the new condition. See PREVIOUS DISTURBANCE 1 for coding instructions.

Item 5.7.2.26 DISTURBANCE YEAR 2 (CORE 2.5.18)
[COND.DSTRBYR2]

Record the year in which DISTURBANCE 2 occurred. See DISTURBANCE YEAR 1 for coding instructions.

Item 5.7.2.27 PREVIOUS DISTURBANCE YEAR 2 (PNW)
[PREV_COND_PNWRS.DSTRBYR2]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous disturbance year can be added for the new condition. See PREVIOUS DISTURBANCE YEAR 1 for coding instructions.

Item 5.7.2.28 DISTURBANCE 3 (CORE 2.5.19)
[COND.DSTRBCD3]

Record the third disturbance here. See DISTURBANCE 1 for coding instructions. Code “00” if no DISTURBANCE 3 is observed.

Item 5.7.2.29 PREVIOUS DISTURBANCE 3 (PNW)
[PREV_COND_PNWRS.DSTRBCD3]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous disturbance can be added for the new condition. See PREVIOUS DISTURBANCE 1 for coding instructions.

Item 5.7.2.30 DISTURBANCE YEAR 3 (CORE 2.5.20)
[COND.DSTRBYR3]

Record the year in which DISTURBANCE 3 occurred. See DISTURBANCE YEAR 1 for coding instructions.

Item 5.7.2.31 PREVIOUS DISTURBANCE YEAR 3 (PNW)
[PREV_COND_PNWRS.DSTRBYR3]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous disturbance year can be added for the new condition. See PREVIOUS DISTURBANCE YEAR 1 for coding instructions.

Item 5.7.2.32 HISTORICAL DISTURBANCE 1 (AFSL, PFSL)
[COND.HIST_DSTRBCD1_PNWRS]

Record the corresponding disturbance code for disturbances which occurred more than 5 years prior to the installation of the new annual inventory plot. This data item is only recorded on new annual inventory plots (SAMPLE KIND = 1). If the plot has been measured previously as a periodic plot, use previous plot write-ups and records as guides to code the important historical disturbances affecting the current stand (including those which originated the stand). Use the same procedures and codes used for DISTURBANCE 1.

Note: Null is erroneous for this data item; code “00” if no HISTORICAL DISTURBANCE 1 is observed.

When collected:	All accessible forest land condition classes on new installations(SAMPLE KIND = 1 and CONDITION CLASS STATUS = 1)
Field width:	2 digits
Tolerance:	No errors
Values:	See DISTURBANCE 1 (Item 5.7.2.20)

Item 5.7.2.33 PREVIOUS HISTORICAL DISTURBANCE 1 (PFSL)
[PREV_COND_PNWRS.HIST_DSTRBCD1_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL DISTURBANCE 1 must be added for the new condition. If added, record the corresponding disturbance code for disturbances before Oc4 (last periodic inventory). If the plot was measured at Oc4, only record this item if the Oc4 crew missed this item in their coding.

Item 5.7.2.34 HISTORICAL DISTURBANCE YEAR 1 (AFSL, PFSL)
[COND.HIST_DSTRBYR1_PNWRS]

Record the year in which HISTORICAL DISTURBANCE 1 occurred.

When collected:	When HISTORICAL DISTURBANCE 1 > 00
Field width:	4 digits
Tolerance:	+/- 1 year for measurement cycles of 5 years
	+/- 2 years for measurement cycles of > 5 years
Values:	Year that is prior to the previous plot visit, or > 5 years ago for plots visited for the first time

Item 5.7.2.35 PREVIOUS HISTORICAL DISTURBANCE YEAR 1 (PFSL)
[PREV_COND_PNWRS.HIST_DSTRBYR1_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL DISTURBANCE YEAR 1 can be added for the new condition. If added, record the year in which PREVIOUS HISTORICAL DISTURBANCE 1 occurred.

Item 5.7.2.36 HISTORICAL DISTURBANCE 2 (AFSL, PFSL)
[COND.HIST_DSTRBCD2_PNWRS]

If a stand has experienced more than one historical disturbance, record the second disturbance here. Use the same procedures and codes used for HISTORICAL DISTURBANCE 1. Code “00” if no HISTORICAL DISTURBANCE 2 is observed and HISTORICAL DISTURBANCE 1 is greater than “00”.

Item 5.7.2.37 PREVIOUS HISTORICAL DISTURBANCE 2 (PFSL)
[PREV_COND_PNWRS.HIST_DSTRBCD2_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL DISTURBANCE 2 can be added for the new condition. If added, record the corresponding disturbance code for disturbances before Oc4 (last periodic inventory). If the plot was measured at Oc4, only record this item if the Oc4 crew missed this item in their coding.

Item 5.7.2.38 HISTORICAL DISTURBANCE YEAR 2 (AFSL, PFSL)
[COND.HIST_DSTRBYR2_PNWRS]

Record the year in which HISTORICAL DISTURBANCE 2 occurred. Use the same procedures and codes used for HISTORICAL DISTURBANCE YEAR 1.

Item 5.7.2.39 PREVIOUS HISTORICAL DISTURBANCE YEAR 2 (PFSL)
[PREV_COND_PNWRS.HIST_DSTRBYR2_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL DISTURBANCE YEAR 2 can be added for the new condition. If added, record the year in which PREVIOUS HISTORICAL DISTURBANCE 2 occurred.

Item 5.7.2.40 HISTORICAL DISTURBANCE 3 (AFSL, PFSL)
[COND.HIST_DSTRBCD3_PNWRS]

If a stand has experienced more than two historical disturbances, record the third disturbance here. Use the same procedures and codes used for HISTORICAL DISTURBANCE YEAR 1. Code “00” if no HISTORICAL DISTURBANCE 3 is observed and HISTORICAL DISTURBANCE 2 is greater than “00”.

Item 5.7.2.41 PREVIOUS HISTORICAL DISTURBANCE 3 (PFSL)
[PREV_COND_PNWRS.HIST_DSTRBCD3_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL DISTURBANCE 3 can be added for the new condition. If added, record the corresponding disturbance code for disturbances before Oc4 (last periodic inventory). If the plot was measured at Oc4, only record this item if the Oc4 crew missed this item in their coding.

Item 5.7.2.42 HISTORICAL DISTURBANCE YEAR 3 (AFSL, PFSL)
[COND.HIST_DSTRBYR3_PNWRS]

Record the year in which HISTORICAL DISTURBANCE 3 occurred. Use the same procedures and codes used for HISTORICAL DISTURBANCE YEAR 1.

Item 5.7.2.43 PREVIOUS HISTORICAL DISTURBANCE YEAR 3 (PFSL)
[PREV_COND_PNWRS.HIST_DSTRBYR3_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL DISTURBANCE YEAR 3 can be added for the new condition. If added, record the year in which PREVIOUS HISTORICAL DISTURBANCE 3 occurred.

Item 5.7.2.44 TREATMENT 1 (CORE 2.5.21)
[COND.TRTCD1_PNWRS]

Forestry treatments are a form of disturbance. These human *caused* disturbances are recorded separately here for ease of coding and analysis. The term treatment further implies that a silvicultural application has been prescribed. This does not include occasional stumps of unknown origin or sparse removals for firewood, Christmas trees, or other miscellaneous purposes. The area affected by any treatment must be at least 1.0 acre in size *(codes 14 and 15 may not seem to meet this area size requirement, yet almost always reflect a localized treatment applied or allowed across a large enough landscape to qualify).* If a tree on the plot has been cut (removed or not) there should be a corresponding "best fit" code for a condition class treatment. Record up to three different treatments per condition class from most important to least important as best as can be determined. This attribute is ancillary; that is, contrasting conditions are never delineated based on variation in this attribute.

For initial plot establishment (*of the annual inventory* SAMPLE KIND = 1 or 3), the treatment must be within the last *five* years. For remeasured plots *(SAMPLE KIND = 2)* recognize only those treatments that have occurred since the previous inventory.

Code the general treatment codes (i.e., 10, 20, etc) only if one of the more specific codes (i.e., 11, 12, etc) does not apply. Code "00" if no TREATMENT 1 is observed.

When collected:	All accessible forest land condition classes (CONDITION CLASS STATUS = 1)			
Field width:	2 digits			
Tolerance:	No errors			
Values:	Code	Treatment	Description	Core codes (office use only)
	00	None	No observable treatment.	00
	10	Cutting	The removal of one or more trees from a stand.	10
	11	Clearcut	Residual trees of all sizes have < 25 percent crown cover.The residual trees usually are cull trees and low-value hardwoods. Not a firewood or local use harvest.	10
	12	Partial cut (heavy) (>20 percent removed)	Remaining trees comprise > 25 percent crown cover and >20 percent of the trees live and 5.0 inches DBH/DRC or larger were harvested. The residual stand usually consists of commercially desirable trees.Not a firewood or local use harvest.	10
	13	Partial cut (light) (<20 percent removed)	Remaining trees comprise > 25 percent crown cover and < 20 percent of the trees live and 5.0 inches DBH/DRC or larger were harvested. The residual stand usually consists of commercially desirable trees.Not a firewood or local use harvest.	10

	14	Firewood or local use cut	The harvest of trees for firewood, or the harvest of trees for products manufactured and used locally by "do-it-yourselfers", often on the ship of origin, for improvements such as buildings, bridges and fences. This code does not require a 1.0-acre minimum size.	10
	15	Incidental cut	Includes 1) the haphazard, seemingly random harvest of occasional trees in an otherwise undisturbed stand, or 2) any harvest activity that does not qualify as another kind of disturbance. Trees may have been cut and left on site or cut and transported off site.This code does not require a 1.0-acre minimum size.	10
	16	Precommercial thin	An intermediate harvest in which excess growing stock are cut but not removed.	10
	17	Improvement cut	Cutting of commercial-sized, unsalable trees to free crop trees from competition. Improvement cutting differs from a commercial thinning in that the trees cut are not marketable.	10
	18	Fire Salvage	A tree removal operation in which many to all of the cut and removed trees were killed by fire during the remeasurement period, and prior to harvest. Code fire salvage when the cutting treatment was likely carried out to utilize fire killed trees or to mitigate hazard otherwise posed by allowing these fire-killed trees to remain. Collected ONLY on conditions where a treatment 11, 12, 13, 14, 15 or 17 is coded for the same treatment year to indicate the type of cut. Typically a corresponding disturbance should also be coded for the condition (Disturbance code 31 ground fire or 32 crown fire).	10
	19	Non-fire Salvage	A tree removal operation in which many to all of the cut and removed trees were killed by non-fire causes, such as drought stress or bark beetles. Code non-fire salvage when the cutting treatment was likely carried out to utilize trees killed by non-fire causes or mitigate hazard otherwise posed by allowing these dead trees to remain. Collected ONLY on conditions where a treatment 11, 12, 13, 14, 15 or 17 is coded for the same treatment year to indicate the type of cut. Typically a corresponding disturbance should also be coded for the condition (for example, Disturbance code 12 insect damage to trees or 54 drought).	10
	20	Site preparation	Clearing, slash burning, chopping, disking, bedding, or other practices clearly intended to prepare a site for either natural or artificial regeneration.	20
	30	Artificial regeneration	Following a disturbance or treatment (usually cutting), a new stand where at least 50 percent of the live trees present resulted from planting or direct seeding.	30
	31	Planting through-out the stand	Planting the area to establish a manageable stand.	30
	32	Planting within nonstocked holes in the stand	Planting of nonstocked openings to fill-in or create a manageable stand.	30
	33	Underplanting	Planting under a sawtimber overstory.	30
	40	Natural regeneration	Following a disturbance or treatment (usually cutting), a new stand where at least 50 percent of the live trees present (of any size) were established through the growth of existing trees and/or natural seeding or sprouting.	40
	50	Other silvicultural treatment	The use of fertilizers, herbicides, girdling, pruning or other activities (*not already listed above*) designed to improve the commercial value of the residual stand, or chaining, which is a practice used on woodlands to encourage wildlife forage.	50
	51	Stand conversion	Killing of low-value or unmarketable trees-often hardwoods-and planting of the area to establish a manageable stand. Most commonly, low-value hardwood stands are converted to conifer stands.	50
	52	Clean and release	Killing or suppression of undesirable, competing vegetation-usually brush or hardwoods-from a manageable stand. A herbicide treatment in young, regenerated stands is one method of clean and release.	50
	60	Chaining	Removal or killing of undesired woody species, not a silvicultural treatment.	50

Item 5.7.2.45 PREVIOUS TREATMENT 1 (PNW)
[PREV_COND_PNWRS.TRTCD1]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous treatment must be added for the new condition. If added, record the code corresponding to the presence of a treatment since the last periodic inventory or within the 5 years prior to the first annual inventory.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 1
Field width:	2 digits
Tolerance:	No errors
Values:	see TREATMENT 1, excluding codes 18 and 19

Item 5.7.2.46 TREATMENT YEAR 1 (CORE 2.5.22)
[COND.TRTYR1]

Record the year in which TREATMENT 1 occurred.

When collected:	When TREATMENT 1 > 00
Field width:	4 digits
Tolerance:	+/- 1 year for measurement cycles of 5 years
	+/- 2 years for measurement cycles of > 5 years
Values:	*Year that is the same or s*ince the previous *annual inventory* plot visit, or *within* the past *five* years for plots visited for the first time

Item 5.7.2.47 PREVIOUS TREATMENT YEAR 1 (PNW)
[PREV_COND_PNWRS.TRTYR1]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous treatment year can be added for the new condition. If added, record the year in which PREVIOUS TREATMENT 1 occurred.

When collected:	When SAMPLE KIND = 2 and PREVIOUS TREATMENT 1 > 00
Field width:	4 digits
Tolerance:	No errors
Values:	Since the last periodic or within the 5 years prior to the first annual inventory

Item 5.7.2.48 TREATMENT 2 (CORE 2.5.23)
[COND.TRTCD2_PNWRS]

If a stand has experienced more than one treatment, record the second treatment here. See TREATMENT 1 for coding instructions*. C*ode *"*00*"* if no *TREATMENT 2 is observed*.

Item 5.7.2.49 PREVIOUS TREATMENT 2 (PNW)
[PREV_COND_PNWRS.TRTCD2]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous treatment can be added for the new condition. If added, record the code corresponding to the presence of a treatment since the last periodic inventory or within the 5 years prior to the first annual inventory.

See PREVIOUS TREATMENT 1 for coding instructions, code 00 if none.

Item 5.7.2.50 TREATMENT YEAR 2 (CORE 2.5.24)
[COND.TRTYR2]

Record the year in which TREATMENT 2 occurred. See TREATMENT YEAR 1 for coding instructions.

Item 5.7.2.51 PREVIOUS TREATMENT YEAR 2 (PNW)
[PREV_COND_PNWRS.TRTYR2]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous treatment year can be added for the new condition. If added, record the year in which PREVIOUS TREATMENT 2 occurred.

Item 5.7.2.52 TREATMENT 3 (CORE 2.5.25)
[COND.TRTCD3_PNWRS]

If a stand has experienced more than two treatments, record the third treatment here. See TREATMENT 1 for coding instructions*. Code"*00*" if no TREATMENT 3 is observed.*

Item 5.7.2.53 PREVIOUS TREATMENT 3 (PNW)
[PREV_COND_PNWRS.TRTCD3]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous treatment can be added for the new condition. If added, record the code corresponding to the presence of a treatment since the last periodic inventory or within the 5 years prior to the first annual inventory.

See PREVIOUS TREATMENT 1 for coding instructions, code 00 if none.

Item 5.7.2.54 TREATMENT YEAR 3 (CORE 2.5.26)
[COND.TRTYR3]

Record the year in which TREATMENT 3 occurred. See TREATMENT YEAR 1 for coding instructions.

Item 5.7.2.55 PREVIOUS TREATMENT YEAR 3 (PNW)
[PREV_COND_PNWRS.TRTYR3]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a previous treatment year can be added for the new condition. If added, record the year in which PREVIOUS TREATMENT 3 occurred.

Item 5.7.2.56 HISTORICAL TREATMENT 1 (AFSL, PFSL)
[COND.HIST_TRTCD1_PNWRS]

Record the corresponding treatment that occurred more than 5 years prior to the installation of the new annual inventory plot (SAMPLE KIND = 1); this data item is not recorded on remeasurement plots (SAMPLE KIND = 2). If the plot has been measured previously as a periodic plot, use previous plot write-ups and records as guides to code the important historical treatments affecting the current stand (including those which originated the stand). Note: Null is erroneous for this variable. Code “00” if no HISTORICAL TREATMENT 1 is observed.

When collected:	All accessible forest land condition classes on new installations (CONDITION CLASS STATUS = 1 and SAMPLE KIND = 1)
Field width:	2 digits
Tolerance:	No errors
Values:	Use the same procedures and codes used for TREATMENT 1 (Item 5.7.2.44)

Item 5.7.2.57 PREVIOUS HISTORICAL TREATMENT 1 (PFSL)
[PREV_COND_PNWRS.HIST_TRTCD1_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL TREATMENT 1 must be added for the new condition. If added, record the corresponding disturbance code for disturbances before Oc4 (last periodic inventory). If the plot was measured atOc4, only record this item if the Oc4 crew missed this item in their coding.

Item 5.7.2.58 HISTORICAL TREATMENT YEAR 1 (AFSL, PFSL)
[COND.HIST_TRTYR1_PNWRS]

Record the year in which HISTORICAL TREATMENT 1 occurred.

When collected:	When HISTORICAL TREATMENT 1 > 00
Field width:	4 digits
Tolerance:	+/- 1 year for measurement cycles of 5 years
	+/- 2 years for measurement cycles of > 5 years
Values:	Year that is prior to the previous plot visit, or > 5 years ago for plots visited for the first time

Item 5.7.2.59 PREVIOUS HISTORICAL TREATMENT YEAR 1 (PFSL)
[PREV_COND_PNWRS.HIST_TRTYR1_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL TREATMENT YEAR 1 can be added for the new condition. If added, record the year in which PREVIOUS HISTORICAL TREATMENT 1 occurred.

Item 5.7.2.60 HISTORICAL TREATMENT 2 (AFSL, PFSL)
[COND.HIST_TRTCD2_PNWRS]

If the stand has experienced more than one historical treatment, record the second treatment here. Use the same procedures and codes used for HISTORICAL TREATMENT 1. Code "00" if no HISTORICAL TREATMENT 2 is observed and HISTORICAL TREATMENT 1 is greater than "00".

Item 5.7.2.61 PREVIOUS HISTORICAL TREATMENT 2 (PFSL)
[PREV_COND_PNWRS.HIST_TRTCD2_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL TREATMENT 2 can be added for the new condition. If added, record the corresponding disturbance code for disturbances before Oc4 (last periodic inventory). If the plot was measured at Oc4, only record this item if the Oc4 crew missed this item in their coding.

Item 5.7.2.62 HISTORICAL TREATMENT YEAR 2 (AFSL, PFSL)
[COND.HIST_TRTYR2_PNWRS]

Record the year in which HISTORICAL TREATMENT 2 occurred. Use the same procedures and codes used for HISTORICAL TREATMENT 1.

Item 5.7.2.63 PREVIOUS HISTORICAL TREATMENT YEAR 2 (PFSL)
[PREV_COND_PNWRS.HIST_TRTYR2_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL TREATMENT YEAR 2 can be added for the new condition. If added, record the year in which PREVIOUS HISTORICAL TREATMENT 2 occurred.

Item 5.7.2.64 HISTORICAL TREATMENT 3 (AFSL, PFSL)
[COND.HIST_TRTCD3_PNWRS]

If the stand has experienced more than two historical treatments, record the third treatment here. Use the same procedures and codes used for HISTORICAL TREATMENT 1. Code “00” if no HISTORICAL TREATMENT 3 is observed and HISTORICAL TREATMENT 2 is greater than “00”.

Item 5.7.2.65 PREVIOUS HISTORICAL TREATMENT 3 (PFSL)
[PREV_COND_PNWRS.HIST_TRTCD3_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL TREATMENT 3 can be added for the new condition. If added, record the corresponding disturbance code for disturbances before Oc4 (last periodic inventory). If the plot was measured at Oc4, only record this item if theOc4 crew missed this item in their coding.

Item 5.7.2.66 HISTORICAL TREATMENT YEAR 3 (AFSL, PFSL)
[COND.HIST_TRTYR3_PNWRS]

Record the year in which HISTORICAL TREATMENT 3 occurred. Use the same procedures and codes used for HISTORICAL TREATMENT 1.

Item 5.7.2.67 PREVIOUS HISTORICAL TREATMENT YEAR 3 (PFSL)
[PREV_COND_PNWRS.HIST_TRTYR3_PNWRS]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous accessible forestland condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS HISTORICAL TREATMENT YEAR 3 can be added for the new condition. If added, record the year in which PREVIOUS HISTORICAL TREATMENT 3 occurred.

Item 5.7.2.68 SALVAGE VOLUME CLASS (PFSL, AFSL)
[COND.SALVAGE_VOL_CLASS_PNWRS]

When a Salvage treatment is coded for the condition, collect the salvage volume class. Salvage volume class is an estimate of the percent of the cut timber volume derived from trees that were DEAD before the salvage operation. Field crews have multiple resources for informing their estimate of the best-fitting salvage volume class, including observations of tree status and condition of stumps across the surrounding area (on and off plot), conversations with landowners and local land managers, and their own knowledge of local silvicultural practices and recent activity. No calculations are expected in the field, but the table below can assist in gauging relative VOLUME for trees of various DBH; if there was less than 100% mortality prior to the harvest and heterogeneous DBH, this will be important for assigning the best salvage volume class. For example, salvage after a crown fire which killed all trees = salvage volume class 3, but if several large trees survived the fire and were cut as part of the harvest then salvage volume class may be 2 or 1 due to the amount of volume the large live trees represent.

DBH	VOLUME/BIOMASS	Multiplier
3”	25	1
5”	100	4
9”	400	16
16”	1600	64
28”	6400	256
50”	25600	1024
DBH:volume ratios derived from Douglas-fir DRYBIOT in PNW-FIA database.		

When collected:	When TREATMENT 2 or TREATMENT 3 = 18 or 19	
Field width:	1 digit	
Tolerance:	+/- 1	
Values:	1	1-32% of the cut wood volume was DEAD prior to cutting
	2	33-65% of the cut wood volume was DEAD prior to cutting
	3	66-100% of the cut wood volume was DEAD prior to cutting

Item 5.7.2.69 CHAINING CODE (CORE 2.5.34)
[COND.CHAINING_CD]

Record the code identifying if a condition has been chained, shear bladed, roller chopped, etc., for the purpose of increased forage production. These treatments contrast with silvicultural removals in that little or none of the woody material is removed from the site and there are few residual live trees.

When collected:	When CONDITION CLASS STATUS = 1 or 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	No
	1	Yes

Item 5.7.2.70 COVER CLASS (CORE 2.5.28)
[COND.LAND_COVER_CLASS_CD]

Record this variable to describe the Area of Observation within each mapped condition. As with CONDITION CLASS STATUS, COVER CLASSes must meet the minimum area and width requirements, except those cases where the condition has been defined due to one of the exceptions to the size and width requirements. If the condition is less than 1 acre, then apply the key to the condition. In order to assign a single cover class to a mapped condition that contains more than one candidate cover class, proceed as follows: if no prospective cover classes meet the minimum width and area requirements, apply the key to the acre area that is within the condition being evaluated and closest to the lowest numbered subplot center associated with the condition. If multiple cover classes (i.e., those which meet minimum area and width requirements) exist in the condition, assign the first cover class that is encountered to the condition. As with other condition attributes, inclusions (of less than 1 acre) within the condition should be ignored when assigning the COVER CLASS. Therefore, areas of the inclusion within the acre area are ignored when making the relative cover assessments. Apply the key as a guide and/or to verify the COVER CLASS selection.

Assignment of COVER CLASS code is hierarchical in nature, and should be performed using the following hierarchical key. Following the guidance of the key, codes should be examined in succession, and the first definition that describes the area of the condition should be chosen. For example, if an area has 15% tree cover that is taller than the 50% shrub cover, it is classified as class 01 (Tree Cover). Note: Tree Cover is not equivalent to Forestland (e.g., a recent clearcut could be Forestland, but would not be Tree Cover). Vegetative cover, as used below, includes the area of ground covered by the vertical projection of the live plant canopy (or other vegetation components like flowers, basal structures or vines) on the area defined by the condition. If foliage is absent due to senescence or dormancy, the cover should be estimated based on the position of plant remains or other evidence of the foliar distribution during the growing season. If vegetation rooted outside of a condition is hanging over the condition being evaluated, it is considered in the cover calculations. If burned, then classify based on the remaining live vegetation, including the canopy cover of remaining live trees and shrubs. When the surface of a condition is covered by deep non-permanent snow, ice, or water, and/or a condition is defined as CONDITION CLASS STATUS 5 (denied access or hazardous), field crews should use aerial imagery, local knowledge, and field observations to best determine COVER CLASS.

For entirely nonsampled plots: Assess COVER CLASS for the condition class that would be defined at plot center if ground visited.

Full Cover Class Definitions

- **Dominant:** Refers to the highest (tallest) life form present that is not overtopped, typically trees, then shrubs, then herbaceous layers.
- **Predominant:** Refers to the cover class with the highest percent cover in the condition.
- **Vegetated:** Contains at least 10% live vegetation cover.
- **Sparsely Vegetated:** Does not contain at least 10% live vegetation cover.

Cover Classification Key

Follow the key in sequence. **If a class described the condition, then look no further.**

1. ≥10% live vegetative Cover = **Vegetated**, else 2.

    1. 1. Areas on which trees provide 10% or greater canopy cover and are part of the dominant (uppermost) vegetation layer, including areas that have been planted to produce woody crops = **01 Tree Cover**

    1. 2. Areas on which live shrubs provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer = **02 Shrub Cover**

    1. 3. Areas on which live herbaceous vegetation (including seasonally senescent cover) provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer = **03 Herbaceous Cover**

    1. 4. Areas on which non-vascular vegetation provide 10% or greater cover and are part of the dominant vegetation layer = **04 Non-vascular Vegetation Cover**

    1. 5. Areas with 10% or greater live vegetative cover but no one life form has 10% or more cover = **05 Mixed Vegetation Cover**

2. <10% live vegetative cover = **Sparsely Vegetated**

    2. 1. Areas persistently and predominantly covered by water (census and noncensus water, permanent snow and ice) and with less than 10% cover of emergent vegetation. = **10 Water**

    2. 2. Areas predominantly covered with constructed materials with limited plant life = **09 Impervious**

    2. 3. Areas predominantly covered by bare rock, gravel, sand, silt, clay, or other earthen material, which contains <10% vegetation cover regardless of its inherent ability to support life = **08 Barren**

When collected:	All condition classes (CONDITION CLASS STATUS = 1, 2, 3, 4, 5)		
Field width:	2 digits		
Tolerance:	No errors		
Values:	**Codes are ≥10% vegetative cover:**		
	01	Tree Cover	Areas on which live trees provide 10% or greater canopy cover and are part of the dominant (uppermost) vegetation layer, including areas that have been planted to produce woody crops, Christmas trees, orchards, etc. Only include tree species that are listed in Appendix D after taking into account the three exclusion zones (see Item 8.5.1.12, SPECIES (CORE 5.8)). Varieties and subspecies are tallied at the species level and hybrids are based on the dominant external characteristics. Species not included in Appendix D are considered shrub cover. Example areas include forests, forest plantations, reverting fields with ≥10% tree canopy cover, clearcuts with ≥10% tree canopy cover. This category includes cypress swamps and mangroves (not to be confused with aquatic vegetation).

	02	Shrub Cover	Areas on which live shrubs or subshrubs provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer, provided these areas do not qualify as Tree Cover. **Shrub/Subshrub** — a woody plant that generally has several erect, spreading, or prostrate stems which give it a bushy appearance. This includes dwarf shrubs, and low or short woody vines (NVCS 2008) and excludes any species on FIA's tree list. Examples include cranberry bogs, berry crops, and other shrub-dominated wetlands, chaparral, and sagebrush.
	03	Herbaceous Cover	Areas on which live herbaceous vegetation (including seasonally senescent cover) provides 10% or greater cover and are part of the dominant (uppermost) vegetation layer, provided these areas do not qualify as Tree Cover or Shrub Cover. This includes herbs, forbs, and graminoid species. Examples include meadows, prairies, croplands (while crops are present), and improved pasture. This category also includes emergent wetland vegetation like seasonally flooded grasslands, cattail marshes, etc.
	04	Non-vascular Vegetation Cover	Areas on which non-vascular vegetation provides 10% or greater cover and are part of the dominant vegetation layer, provided these areas do not qualify as Tree Cover, Shrub Cover, or Herbaceous Cover. Examples include mosses, sphagnum moss bogs, liverworts, hornworts, lichens, and algae.
	05	Mixed Vegetation Cover	Areas with 10% or greater live vegetative cover but no one life form has 10% or more cover. That is, these areas do not qualify as Tree Cover, Shrub Cover, Herbaceous Cover, or Non-vascular Vegetation Cover, and thus are a mixture of plant life forms. Examples can include early stages of reverting fields and high deserts.
	Codes are < 10% live vegetation cover:		
	08	Barren	Areas predominately covered by bare rock, gravel, sand, silt, clay, or other earthen material, which contains <10% vegetation cover regardless of its inherent ability to support life. Examples include naturally barren areas such as lava fields, gravel bars, sand dunes, salt flats, deserts, playas, and rock outcroppings as well as areas of bare soil exposed by land clearing (including plowed, harvested, or planted but not yet emerged cropland), wildfire and other forms of disturbance. Also includes minerals and other geologic materials exposed by surface mining and roads made of dirt and gravel
	09	Impervious	Areas predominantly covered with constructed materials that contain< 10% vegetation cover. Examples include paved roads, parking lots, driveways, sidewalks, rooftops and other man-made structures.
	10	Water	Areas persistently covered and predominated by water and have <10% emergent vegetative cover. Examples include census and noncensus water and permanent snow and ice as well as glaciers. For example, only the open water portion of a bog is to be included.

Item 5.7.2.71 PLANT ASSOCIATION (PFSL)
[COND.HABTYPCD1; PREV_COND_PNWRS.HABTYPCD1]

Plant associations describe the climax or mature plant community on a site based on the combined abundance of all vascular plant species (trees, shrubs, and forbs). They are used to infer climate conditions and to link plots to other information on suitability for management, productivity, and habitat.

Oregon, Washington, and R6 Forest Service administered lands in California (Siskiyou NF and Rogue River NF): Most of the land in these areas have plant association guides applicable to forested lands (see maps in Appendix C for which guides to use where). Some areas on R6 Forest Service administered lands also have nonforest plant associations available (e.g., the Oregon Dunes). In these areas, the plant association code is a 6-digit code that describes the predominant plant association of the site within the Area of Observation. The first two digits describe the series, defined by the climax (most shade tolerant) tree species found in the reproduction layer, the third and fourth digits relate to the dominant lifeform in the understory (e.g., shrub, forb, or grass) and the fifth and sixth digits relate to understory vegetation composition. The code is downloaded for condition class 1 if recorded at the previous visit. If the downloaded code is a 4-digit code, it should be updated to the full 6-digit association if at all possible. For some woodland and range types, 4-digit codes are the best available and are acceptable to use. In these situations, PLANT ASSOCIATION NONSAMPLED REASON (Item 5.7.2.72) must be recorded.

If no guide exists to cover the area a plot is in, or if a stand is too young (less than 30 years old) or too disturbed to determine the full plant association, keep the previous 4-digit code if available or record the first two digits of the plant association series from the table below. In these situations, PLANT ASSOCIATION NONSAMPLED REASON (Item 5.7.2.72) must be recorded.

Code	Plant Community Association
CA	Sub-alpine fir, Mountain hemlock, Whitebark pine (open forest)
CC	Western redcedar
CD	Douglas-fir
CS	Sitka spruce
CE	Sub-alpine fir, Englemann spruce (closed forest)
CF	Silver fir, Noble fir
CH	Western hemlock
CJ	Juniper, Pinyon pine
CL	Lodgepole pine (climax or seral)
CM	Mountain hemlock
CP	Ponderosa pine, Jeffrey pine
CW	White fir, Grand fir
CX	Coniferous forest
HX	Hardwood forest
HA	Alder
HB	Bigleaf maple
HC	Cottonwood, Ash bottomland, Overflow bottomland
HO	Oregon white oak
HQ	Quaking aspen
HT	Tanoak

Colville, Spokane, and Warm Springs Indian Reservations: Use the FIA version of these publications and record the 6-digit code assigned to each plant association (e.g., CDS715).

On remeasurement plots (SAMPLE KIND = 2), previous PLANT ASSOCIATION will be downloaded if one was recorded at the last visit. Field crews are required to verify that the downloaded code is reasonable for the condition class. Updates to the downloaded code should be made only if one of the following situations applies:

1. No code was entered previously but now there is one that describes the stand.
2. The code can be more specific (i.e., a 2- or 4-digit code was used in Oregon or Washington, but a 6-letter code is available)
3. The previous code is an obvious error or typo.
4. The previous code is from the wrong plant association series.
5. The previous code is from the wrong plant association guide book.

When collected:	When CONDITION CLASS STATUS = 1 or 2, ADMINISTRATIVE FOREST CODE = 0601-0699, and plant association guides are available: or When CONDITION CLASS STATUS = 1 or 2, OWNER CODE = 22 and BLM RESOURCE AREA = not null, and plant association guides are available: or When CONDITION CLASS STATUS = 1, STATE = 41 or 53, ADMINISTRATIVE FOREST CODE = null, and plant association guides are available: or Downloaded when SAMPLE KIND = 2, ADMINISTRATIVE FOREST CODE = 0601-0699, and PLANT ASSOCIATION was recorded at the previous visit.
Field width:	6-digits (2- or 4-digits in some situations) in Washington, Oregon, and on all R6 Forest Service administered lands
Tolerance:	No errors
Values:	Specific for each guide (see Appendix C, Plant Association Reference)

Item 5.7.2.72 PLANT ASSOCIATION NONSAMPLED REASON (PFSL)
[COND.HABTYPCD1_NSMP_REASN_CD_PNWRS]

If a PLANT ASSOCIATION was not collected, or the recorded PLANT ASSOCIATION code is not a valid 6-character code (i.e., a 2- or 4-letter code was recorded), record the appropriate reason.

When collected:	When CONDITION CLASS STATUS = 1 or 2, ADMINISTRATIVE FOREST CODE = 0601-0699, and PLANT ASSOCIATION code was not collected; or When CONDITION CLASS STATUS = 1 or 2, OWNER CODE = 22 and BLM RESOURCE AREA = not null, and PLANT ASSOCIATION code was not collected; or When CONDITION CLASS STATUS = 1 or 2, ADMINISTRATIVE FOREST CODE = 0601-0699, and PLANT ASSOCIATION code was not collected or is not a valid 6-character code; or When STATE = 41 or 53, CONDITION CLASS STATUS = 1, ADMINISTRATIVE FOREST CODE = null, and PLANT ASSOCIATION code was not collected or is not a valid 6-character code.	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	Null	PLANT ASSOCIATION was sampled.
	1	Plot is in Oregon (STATE = 41) or Washington (STATE = 53) and either a) no guide covers the area the plot is in, or b) the appropriate code in the guide is a 4-digit code. Note: Code 1 should be used if a 2- or 4-letter code was recorded for PLANT ASSOCIATION (PLANT ASSOCIATION PUBLICATION is required when a 4-digit code is recorded).
	2	Stand is too young (e.g., <30 years old)
	3	Stand is too disturbed (e.g., site disturbed within 10 years and dominated by weedy species, native plants in low abundance so determining relative abundance is not reliable).
	4	Other (explain in the electronic CONDITION CLASS NOTES)

Item 5.7.2.73 PLANT ASSOCIATION PUBLICATION (PFSL)
[COND.HABTYPCD1_PUB_CD]

Record the code identifying the PLANT ASSOCIATION PUBLICATION used to determine a PLANT ASSOCIATION for the plot. If the appropriate code in the publication used at the current visit is a 4-digit code, record a PLANT ASSOCIATION PUBLICATION (note: this data item is not required when a downloaded 4-digit code from the previous visit cannot be updated).

When collected:	When PLANT ASSOCIATION NONSAMPLED REASON = null and: CONDITION CLASS STATUS = 1 or 2, ADMINISTRATIVE FOREST CODE = 0601-0699, and plant association guides are available; or When CONDITION CLASS STATUS = 1 or 2, OWNER CODE = 22 and BLM RESOURCE AREA = not null, and plant association guides are available: or CONDITION CLASS STATUS = 1, STATE = 41 or 53, ADMINISTRATIVE FOREST CODE = null, and plant association guides are available. When PLANT ASSOCIATION NONSAMPLED REASON = 1 and a 4-digit code was recorded for PLANT ASSOCIATION.
Field width:	3 digits
Tolerance:	No errors

Values	Code	Publication
	608	Plant association and management guide for the pacific silver fir zone, Gifford Pinchot National Forests (R6-ECOL-130A-1983)
	610	Plant associations of the Crooked River National Grassland, Ochoco National Forest (R6-ECOL-133-1983)
	613	Plant association and management guide for the western hemlock zone, Gifford Pinchot National Forest (R6-ECOL-230A-1986)
	614	Plant association and management guide for the western hemlock zone, Mt. Hood National Forest (R6-ECOL-232A-1986)
	615	Plant associations of the Wallowa-Snake Province, Wallowa-Whitman National Forest (R6-ECOL-TP-255B-86)
	617	Riparian zone associations, Deschutes, Ochoco, Fremont, and Winema National Forests (R6-ECOL-TP-279-87)
	618	Forested plant associations of the Olympic National Forest (R6-ECOL-TP-001-88)
	619	Plant association and management guide for the ponderosa pine, Douglas-fir, and grand fir zones, Mt. Hood National Forest (R6-ECOL-TP-004-88)
	620	Plant association and management guide for the grand fir zone, Gifford Pinchot National Forest (R6-ECOL-TP-006-88)
	621	Field guide to the forested plant associations of the Mt. Baker-Snoqualmie National Forest (R6-ECOL-TP-028-91)
	622	Plant associations of the Blue and Ochoco Mountains (R6-ERW-TP-036-92)
	623	Plant association and management guide for the mountain hemlock zone, Gifford Pinchot and Mt. Hood National Forests (R6-MTH-GP-TP-08-95)
	626	Field guide for forested plant associations of the Wenatchee National Forest (PNW-GTR-359)
	627	Forested plant associations of the Colville National Forest (PNW-GTR-360)
	631	Forest habitat types of the Colville Indian Reservation
	635	Plant association guide for the commercial forest of the Warm Springs Indian Reservation
	638	Forest habitat types of the Spokane Indian Reservation
	639	Pacific Northwest ecoclass codes for seral and potential natural communities (Nonforest plant association guide: PNW-GTR-418)
	641	Field guide to the forested plant associations of southwestern Oregon (R6-NR-ECOL-TP-17-96)
	642	Plant associations of the Oregon Dunes National Recreation Area (R6-NR-ECOL-TP-09-98)
	647	Field guide to the forested plant associations of the westside central Cascades of northwest Oregon (R6-NR-ECOL-TP-02-02)
	648	Field guide to the forested plant associations of the northern Oregon Coast Range (R6-NR-ECOL-TP-03-02)
	653	Forested plant associations of the Oregon east Cascades (R6-NR-ECOL-TP-2007)

SUBSECTION 5.7.3 DETERMINING CONDITION CLASSES ON NONFOREST LAND

Within measurable nonforest (NONFOREST CONDITION CLASS STATUS = 2), nonforest land may be subdivided into condition classes that are based on differences in OWNER GROUP, RESERVED STATUS, and NONFOREST LAND USE. See Subsection 5.2.2, Nonforest Land, for information on plots that are entirely nonforest.

Item 5.7.3.1 PRESENT NONFOREST LAND USE (CORE 2.5.29) [COND.PRESNFCD]

Record this attribute for every CONDITION CLASS STATUS = 2 condition class sampled. Aside from the developed land uses (30-34), PRESENT NONFOREST LAND USE shares the same size requirements as CONDITION CLASS STATUS 1 and 2 conditions; at least 1 acre in size with a minimum width of 120 feet. When NONFOREST SAMPLING STATUS = 0, recognizing multiple nonforest conditions on a subplot is required if the subplot currently contains accessible forest land and/or portions of the subplot were classified as accessible forest land during the previous field visit; otherwise only the PRESENT NONFOREST LAND USE at subplot center is recorded. When NONFOREST SAMPLING STATUS = 1, multiple PRESENT NONFOREST LAND USES are recognized on the subplot regardless of the current or past presence of accessible forest land on the subplot. For those areas that have changed from forest to nonforest, this variable is used to track land use change. Conversions from forest to nonforest become new nonforest conditions whenever they occur, except when a previously defined nonforest condition has expanded into an adjacent previously defined forest condition. This expanded condition will be captured through boundary changes on respective subplots and does not constitute a new separate condition. Instructions in Section 5.1 and Section 5.2 apply.

The following guidelines apply to all PRESENT NONFOREST LAND USEs (except the Developed land uses 30-34, which do not have size requirements).

- In cases where the first encountered potential PRESENT NONFOREST LAND USE does not meet minimum size requirements but is bounded by a single qualifying adjacent PRESENT NONFOREST LAND USE, the former will be considered an inclusion in the latter which will be used to represent the condition within the Area of Observation.
- Nonforest conditions may consist of multiple non-qualifying PRESENT NONFOREST LAND USEs that are less than an acre and or less than 120 feet in width (excluding the Developed land uses 30-34). In such cases, the first nonforest land use encountered will be used to represent the condition, assuming the combined areas of the multiple nonforest land uses is at least 120 feet and an acre.
- In cases where a wooded strip does not meet size requirements for accessible forest land, it is considered an inclusion and needs to be lumped with an adjacent qualifying condition. If it is bordered on each side by two different qualifying distinct and specific Nonforest land uses, assign the wooded strip to the condition that Plot Center (PC) is closest to.
- In cases where a wooded strip does not meet size requirements for accessible forest land and it is bordered on each side by two different non-qualifying Nonforest land uses, assuming the combined area of all three is at least 120 feet and an acre, assign the strip of trees a Nonforest land use of 40 (Other).

See Section 5.2.2 for rules on delineating between PRESENT NONFOREST LAND USES.

When collected:	All nonforest conditions (CONDITION CLASS STATUS = 2)			
Field width:	2 digits			
Tolerance:	No errors			
Values:	Code	Land Use		Definition
	10	Agricultural land		Land managed for crops, pasture, or other agricultural use; the area must be at least 1.0 acre in size and 120.0 feet wide (with the exception of windbreak/shelterbelt, which has no minimum width). Use code 10 only for cases not better described by one of the following:
		11	Cropland	*i.e., mint, wheat, rye, corn, planted berry fields, vineyards*
		12	Pasture	Improved through cultural practices *such as grading and mowing*
		13	Idle farmland	
		14	Orchard	
		15	Christmas tree plantation	
		16	Maintained wildlife opening	
		17	Windbreak/ Shelterbelt	
	20	Rangeland *(Grass/ Forb/Shrub land)*		Land primarily composed of grasses, forbs, or shrubs. This includes lands vegetated naturally or artificially to provide a plant cover managed like native vegetation and does not meet the definition of pasture, *vegetated wetlands or chaparral*. The area must be at least 1.0 acre in size and 120.0 feet wide
	30	Developed		Land used primarily by humans for purposes other than forestry or agriculture. Use the code 30 only for land not better described by one of the following:
		31	Cultural or Urban	Business (industrial/commercial), residential, and other places of intense human activity
		32	Rights-of-way	Improved roads, railway, power lines, maintained canal
		33	Recreation	Parks, skiing, golf courses
		34	Mining	

	40	Other		Land parcels greater than 1.0 acre in size and greater than 120.0 feet wide, which do not fall into one of the uses described above *or below*. Examples include undeveloped beaches, barren land (rock, sand), marshes, bogs, ice, and snow. Use the 40 code only for cases not better described by one of the following:
		41	*Naturally* nonvegetated	*Barren rock, sand, lava, glaciers (ice), undeveloped beaches, glacial outwash*
		42	*Vegetated* wetland	*Vegetated lands where at some period in the year, the water table is usually at or near the surface, or the land is covered by shallow water. Includes: swamps, peatlands (bogs, fens, muskegs), marshes, and tidal flats*
		43	Beach	
		45	Nonforest-Chaparral	*Areas currently covered or previously covered with heavily branched dwarfed trees or shrubs, usually evergreen, the crown canopy of which covers or previously covered greater than 10 percent of the ground and are expected to recover to chaparral after a disturbance. The principal species are dwarf Quercus, Cercocarpus, Garrya, Ceanothus, Arctostaphylos, Baccharis, and Adenostoma. Areas in which the predominant cover is Artemisia, Purshia, Gutierrezia, Opuntia, or semi-desert species are considered rangeland (code 20). Note: the condition may qualify as forest land if the species present are on the tree species list and meet the canopy cover requirements for forest land, regardless of their dwarfed characteristics.*

Item 5.7.3.2 PREVIOUS NONFOREST LAND USE (PNW)
[PREV_COND_PNWRS.PRESNFCD_PNWRS][PREV_COND_PNWRS.PRESNFCD]

A downloaded value that can only be updated by the current crew when a previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP is corrected and when PREVIOUS DATA CORRECTABLE = Y. If a previous nonforest condition class is added to correct previous crew error in PREVIOUS CONDITION CLASS STATUS, PREVIOUS RESERVED STATUS, or PREVIOUS OWNER GROUP, a PREVIOUS NONFOREST LAND USE must be added. If added, record the PREVIOUS NONFOREST LAND USE for all nonforest conditions (Condition Status 2). Use the codes and classifications listed in NONFOREST LAND USE.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION STATUS = 2
Field width:	2 digits
Tolerance:	No errors
Values:	See NONFOREST LAND USE

SECTION 5.8 DETERMINATION OF CROWN COVER VALUES FOR LAND USE CLASSIFICATION

SUBSECTION 5.8.1 INTRODUCTION

This section describes the procedures and data items needed to populate the condition-level canopy cover variables (Item 5.8.2.2, LIVE CANOPY COVER (CORE 2.5.30.2), Item 5.8.2.3, LIVE PLUS MISSING CANOPY COVER (CORE 2.5.30.3), and Item 5.8.2.6, TOTAL STEMS (CORE 2.5.33)). The procedures should be used whenever LIVE PLUS MISSING CANOPY COVER is not obviously less than 5 percent or not obviously greater than 15 percent. The procedures are also needed for a sensitivity analysis that will assess the differences between a crown cover and a stocking definition of accessible forest land. Therefore, this study will also be conducted on plots when it is questionable whether the condition is 10 percent stocked.

Two sets of data will be collected for the study:

1. Cover plot information
2. Stocking tree data

SUBSECTION 5.8.2 CANOPY COVER VARIABLES OVERVIEW

<u>Canopy cover variables are condition level variables that are collected on all CONDITION CLASS STATUS = 1, 2, and 5 conditions. A condition requires a minimum LIVE PLUS MISSING CANOPY COVER of 10 percent from species that are valid within the geographic area that the plot is located in according to the tree species list (Appendix D) to be classified as forest land.</u>

<u>In order for a condition to be considered forest it must contain 10 percent LIVE PLUS MISSING CANOPY COVER, meet minimum size requirements, and not be subject to nonforest use(s) that prevent normal tree regeneration and succession, such as regular mowing, intensive grazing, or recreation activities. Areas of potential forest that do not meet size requirements are considered inclusions within the surrounding nonforest condition. When conducting a canopy cover check to determine if the 10 percent threshold has been met, do NOT include any canopy cover derived from inclusions; although such canopy cover is included when populating the LIVE CANOPY COVER variable.</u>

<u>Using canopy cover to determine if an area meets the definition of forestland in sparsely treed areas.</u>

<u>**Homogenous areas:** When the tree density of a potential condition is homogenous or when it is not clear that the tree density is not homogenous, use the Acre CANOPY COVER SAMPLING METHOD to determine if the area qualifies as forestland based on canopy cover.</u>

<u>**Isolated islands or groups of trees:** In some cases, tree density may not be homogenous, but will consist of groups or islands of trees with greater than or equal to 10 percent canopy cover, none of which meet the minimum forestland size requirement individually. Examples of such areas may include reverting fields, rangeland, pastures, areas of exposed bedrock, sand dunes, beaches, bogs, marshes, or clumps of trees in an alpine environment. In these cases, first define all areas between the islands or groups that qualify as nonforest land. In doing so it will become apparent that some of the islands or groups may be inclusions within their surrounding nonforest condition (inclusions are excluded from the canopy cover check process when determining if the sample area meets the forestland canopy cover threshold). Second, evaluate the remaining island or groups of trees with a canopy cover check. This may require installing phantom subplots. It is not uncommon for areas that look like forestland to end up as nonforest land due to the patchiness of trees that are present.</u>

Item 5.8.2.1 CANOPY COVER SAMPLE METHOD (CORE 2.5.30.1) [COND.CANOPY_CVR_SAMPLE_METHOD_CD]

Tree cover and stocking data will be collected on the following plot configurations:

1. A single, fixed-area one acre plot that is a 118-foot radius circle
2. Four fixed-area quarter acre subplots that are 58.9-foot radius circles

These cover plot configurations must be entirely within one condition class. When there is only one condition class present on the plot either the single, fixed-area one acre plot should be established from the center of subplot 1 on the FIA annual plot layout *or* the four fixed area quarter acre subplots should be established from the center of subplots 1, 2, 3, and 4 on the FIA annual plot layout.

When multiple condition classes occur on the plot, only use the four fixed-area subplot configuration to collect stocking and cover data. Locate “phantom” cover subplots following the installation instructions below so they are completely within one condition class until you have four of them, or you reach both 25 percent stocking and 25 percent cover. Do not move phantom subplots to better represent the condition in question if phantom subplots fall in sparsely-treed areas or heavier-treed areas. Make sure to note the location of each cover subplot on the location sketch map on the plot card.

Ocular Method

- If LIVE PLUS MISSING CANOPY COVER is ≤5% OR
- If LIVE PLUS MISSING CANOPY COVER is ≥15% OR
- On CONDITION STATUS = 2 conditions where access to the nonforest area may be limited OR
- If the nonforest condition is a developed or agricultural nonforest land use OR
- When CONDITION CLASS STATUS = 5.

Acre Methods

- If LIVE PLUS MISSING CANOPY COVER is >5% and <15%

Record the CANOPY COVER SAMPLE METHOD used to determine LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER for the condition. If the ocular method is not used, the appropriate plot-based method should be selected according to the condition's dimensions and shape.

Ocular method - The Ocular method is only used in areas that are obviously less than or equal to 5 percent LIVE PLUS MISSING CANOPY COVER or obviously greater than or equal to 15 percent LIVE PLUS MISSING CANOPY COVER. In addition to visual inspections of what is on the ground, crews can also use various types of aerial imagery to help determine LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER values using this method. The Ocular method may also be used on CONDITION CLASS STATUS = 2 conditions where access to the nonforest canopy cover area may be limited; it is clear there is no change from a nonforest classification made at the previous visit, imagery, and/or observations made from a helicopter that tree canopy cover is well below 10 percent; or the nonforest condition is a developed or agricultural nonforest land use. Note that when the Ocular method is used, it is limited to the Area of Observation of the condition. The Ocular method is also used when CONDITION CLASS STATUS = 5.

Acre method - The Acre method is used, where regionally permitted, when the ocular method is not appropriate, when it is safe and practical to sample on the entire acre, and LIVE PLUS MISSING CANOPY COVER is greater than 5 percent and less than 15 percent.

1. To determine if minimum 10 percent LIVE PLUS MISSING CANOPY COVER is reached (4356 ft2), the crew samples all live, dead, and missing tree canopies on the one-acre sample area (single 118 foot radius plot, or four 58.9 foot radius macroplots) as described above in LIVE PLUS MISSING CANOPY COVER.
2. The sample acre (*single* 118 foot radius plot, or *four 58.9 foot radius macroplots*) must fall entirely in the questionable condition.

Phantom Plot Installation - Install phantom subplots as necessary to yield four 1/4-acre sample areas that fall entirely within the questionable condition that is not obviously forest or nonforest. Record the location of these phantom or temporary subplots on the four point plot sketch and monument based on regional protocols. Establish phantom subplots using the following protocol (Figure 5.19):

a. Begin by locating the phantom subplots using the "highest" numbered regular subplot that falls entirely in the questionable condition (e.g., 4 is the highest numbered regular subplot, next 3 and then 2). The phantom subplots are located in the following fashion (1) 120.0 feet at 360 degrees, (2) 120.0 feet at 120 degrees, then (3) 120.0 feet at 240 degrees.
b. If this fails to yield 4 subplots that fall entirely within the questionable condition, install the remaining phantom subplots off the next highest numbered regular subplot that falls in the questionable condition.
c. If this fails to produce a suitable location, *then put in the next phantom cover subplot off the last established phantom cover subplot*, until 4 subplots have been established entirely within the questionable condition.
d. For narrow linear conditions that don't allow for phantom rotation protocols phantom subplots should be placed methodically within the condition in question (e.g., divide the length of the strip by 5 to determine the distance between subplots).

e. Do not move phantom subplots to better represent the condition in question if phantom subplots fall in sparsely-treed areas or heavier-treed areas. It is critical to keep the phantoms within the questionable condition and out of obviously nonforest areas.

f. If a portion of a plot falls in a condition that is clearly nonforest and the remaining portion falls in a sparsely treed area of marginal canopy cover, 4 subplots/phantom will need to be installed in the sparsely treed area to check for 10 percent canopy cover to qualify for forestland. If the results turn out to be less than 10 percent canopy cover, the plot as a whole is defined as one nonforest condition. With only one condition present, the canopy cover from the phantom subplots will be ignored and the canopy cover estimate for the condition will be based on the original four subplots.

g. If the condition in question is too small to establish 4 phantom subplots, (e.g. 236 feet x 236 feet) then install the one phantom 118 foot radius plot in the center of the condition. Use this method as a last resort only. If establishing one phantom 118 foot radius plot at a new location, record COVER SUBPLOT as 1 and take GPS coordinates at the radius center. Enter the coordinates in GPS LOCATION TYPE = 7 with a note “cover subplot 1”. Record the location of this phantom plot on the plot card location sketch map. Make detailed PLOT NOTES describing the location of phantom plot using azimuth and distance from plot center.

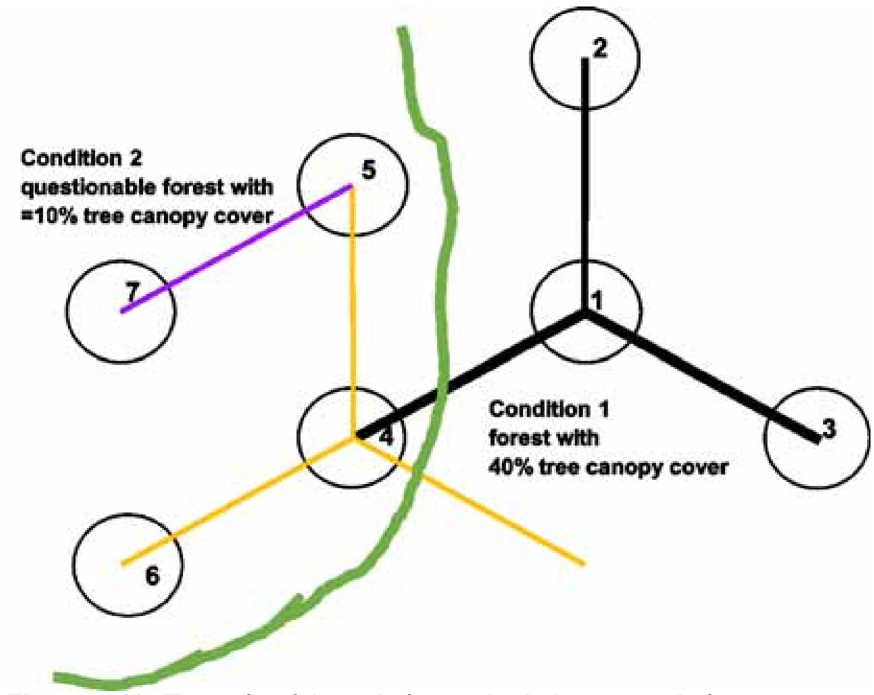


Figure 5.19: Example of the subplot method phantom subplots.

The general guide for installing phantom cover subplots is: Install the next phantom cover subplot off the highest FIA subplot entirely within the condition, until all the FIA subplots have been exhausted. Then put in the next phantom cover subplot off the last established phantom cover subplot.

Transition zones and forest/nonforest encroachment – When an accessible forestland condition encroaches into a nonforest condition, the border between forest and nonforest is often a gradual change in tree cover with no clear and abrupt boundary. This may cause difficulties determining exactly where the forested area meets the minimum canopy cover or stem count criteria. For these cases, determine where the land clearly meets the minimum requirements, and where it clearly is less than required. Divide the zone between these points in half, and determine the side of the zone on which the subplot center is located. Classify the condition class of the subplot based on this line.

When collected:	CONDITION CLASS STATUS = 1, 2, or 5		
Field width:	1 digit		
Tolerance:	None		
Values:	Code	Description	Core codes (office use only)
	1	Ocular method	1
	3	Acre method *(one 118 foot radius plot installed)*	3
	5	Acre method (four 58.9 foot radius plots installed)	3

Item 5.8.2.2 LIVE CANOPY COVER (CORE 2.5.30.2)
[COND.LIVE_CANOPY_CVR_PCT]

Record the percentage of LIVE CANOPY COVER for the condition. Include live tally trees, saplings, and seedlings that cover the sample area. For conditions where the LIVE CANOPY COVER is low and there is a question whether it meets 10 percent LIVE PLUS MISSING CANOPY COVER, the crew will measure every crown width within the canopy cover sample area (based on the CANOPY COVER SAMPLE METHOD) and enter the total LIVE CANOPY COVER percent from the *stocking/*canopy cover calculator in the PDR (always round down to the nearest percent). LIVE CANOPY COVER can be based on an ocular estimate when the condition in question is certain to contain less than 6 percent or greater than 14 percent LIVE PLUS MISSING CANOPY COVER or CURRENT AFFORESTATION CODE = 1 and TOTAL STEMS greater than or equal to 150. For LIVE CANOPY COVER less than 1 percent (trace), record 01.

- Include live trees, saplings, and seedlings species that are valid within the geographic area that the plot is located in according to the tree species list (Appendix D).
- Trees, saplings, and seedlings with stems originating within the entire Acre, or their associated phantoms are counted in this process.
- Only include tree canopy measurements from trees with stems that originate within the sample area, although canopy measurements can extend outside the sample area.
- Occasionally, a branch may protrude abnormally, but the lateral crown line is drawn across the portion of the branch which includes the "normal outline" of the tree.
- Do not compact crown width measurements (with exception of abnormal branches) even if trees are sparsely leafed. Crown width measurements are not compacted and are measured to the end of the branches regardless of how sparsely leafed the branches are.
- Hardwood seedlings must have a length of at least 1 foot and softwoods a length of at least 6 inches to be included in canopy cover.
- Grasses, herbs, shrubs, and UNLISTED tree species are not considered when determining whether a crown is overtopped.
- For entirely nonsampled plots (CONDITION CLASS STATUS = 5), use current and historical imagery to determine LIVE CANOPY COVER of the condition class that would be defined at plot center if ground visited.

LIVE CANOPY COVER can be based on an ocular estimate when the condition in question is certain to contain greater than 14 percent or less than 6 percent LIVE PLUS MISSING CANOPY COVER or CURRENT AFFORESTATION CODE = 1 and TOTAL STEMS greater than or equal to 150. For LIVE CANOPY COVER less than 1 percent (trace), record 01.

When collected:	All CONDITION CLASS STATUS = 1, 2, or 5
Field width:	2 digits
Tolerance:	+/- Class one class: 0-5, 6-7, 8-9, 10-12, 13-15, 16-19, 20-24, 25-49, 50-74, 75-100
Values:	00 - 99 (where 99 = 99-100%)

Item 5.8.2.3 LIVE PLUS MISSING CANOPY COVER (CORE 2.5.30.3)
[COND.LIVE_MISSING_CANOPY_CVR_PCT]

LIVE PLUS MISSING CANOPY COVER is used to ensure that a temporary reduction in LIVE CANOPY COVER does not result in a forested condition being reclassified to a nonforest condition solely due to natural events or management practices that the canopy is expected to recover from.

Record the percentage of LIVE PLUS MISSING CANOPY COVER for the condition by adding the LIVE CANOPY COVER to the estimated missing canopy cover. Missing canopy cover includes all dead, harvested, and removed trees, saplings, and seedlings as well as dead portions of live trees. Only include species that are valid within the geographic area that the plot is located in according to the tree species list (Appendix D). Do not include missing canopy that has been replaced by the current live canopy or missing canopy that existed before the most recent conversion of a forested condition to a nonforest condition. Base the estimate on field observations, aerial photos, historical aerial imagery, and similar evidence in adjacent stands that do not have dead, harvested, or removed trees. The total of the LIVE PLUS MISSING CANOPY COVER cannot exceed 100%.

- Forest land cannot be classified as nonstocked indefinitely. The timeframe listed below marks the amount of time a condition initially classified as nonstocked forestland may remain so if the condition does not contain any live seedling, saplings, or trees within the CANOPY COVER SAMPLE METHOD used to evaluate it (Acre or Phantom). At which point, after the timeframe is reached, the previously nonstocked condition is considered converted to nonforest land.
  - 30 years
- Use professional judgment when estimating missing crowns from stumps. Take into consideration the spacing of the stumps and the size of any possible remaining live crowns in the area.
- Do not double count canopy layers. Live canopy supersedes any missing canopy at the same location. Ignore portions of missing canopy that have live trees, saplings, and seedlings below them.
- For entirely nonsampled plots, use current and historical imagery to determine LIVE PLUS MISSING CANOPY COVER of the condition at plot center.
- If there was a conversion from a forestland condition to a nonforest condition and now the converted condition is starting to regenerate, ignore any missing canopy that was present prior to the conversion.
- Don't count missing canopy that has been replaced by new growth, even if the new growth is now dead. It's the new growth (now dead) that is counted as missing canopy.

Do not include missing canopy cover in the following situations because in these cases LIVE CANOPY COVER should equal LIVE PLUS MISSING CANOPY.

- In contrast to regular mowing (a sign of a nonforest condition), chaining or similar treatments are recognized as long-term periodic or one-time treatments. Although the intent of chaining may be permanent removal of trees, reoccupation is common in the absence of additional treatments and sometimes the treatment does not remove enough to reduce canopy cover below the threshold of forestland. As a result, only live canopy cover should be considered in the forestland determination in those areas that have been chained or have received similar treatments where the intent was the permanent removal of trees; missing (dead or removed) canopy cover is not considered in the forestland call.
- Agricultural practices such as grazing that are so intensive that live canopy cover is reduced below 10 percent, thus creating a nonforest condition.
- There has been a deliberate conversion to a developed or agricultural nonforest condition.
- Unless the previous crew made an obvious error, do not include missing canopy cover on a remeasure plot that was initially determined to be nonforest. Once a condition has been classified as nonforest, the missing canopy cover timeline starts fresh and missing canopy from prior to, or as a result of, the conversion to a nonforest condition is not considered at remeasurement when evaluating the condition as potential forestland.
- A natural / semi-natural CONDITION CLASS STATUS change prevents the establishment and survival of trees. These are the instances where the canopy is not expected to recover. For example:
  - Beaver activity or landslides cause a long-term back-up of a waterway, converting the area to Noncensus or Census water after the trees die.
  - A volcanic lava flow, major rockslide, or other similar event changes the site condition to such an extent that it could no longer support the establishment or survival of trees, and is now considered nonforest.
  - Saltwater intrudes after a hurricane creating a saltwater marsh.

When collected:	All CONDITION CLASS STATUS = 1 or 5
Field width:	2 digits
Tolerance:	+/- Class one class: 0-5, 6-7, 8-9, 10-12, 13-15, 16-19, 20-24, 25-49, 50-74, 75-100
Values:	00 - 99 (where 99 = 99-100%)

Item 5.8.2.4 CURRENT AFFORESTATION CODE (CORE 2.5.31)
[COND.AFFORESTATION_CD]

Record the code identifying a condition that has no evidence of prior forest, but does have evidence suggesting deliberate afforestation attempts (planted or prepared to promote tree establishment) to convert to forest in the current inventory cycle or since the last measurement.

When collected:	When CONDITION CLASS STATUS = 1 or 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	No
	1	Yes

Item 5.8.2.5 PREVIOUS AFFORESTATION CODE (CORE 2.5.32)
[COND.PREV_AFFORESTATION_CD]

Record the code identifying a condition that has no evidence of prior forest, but does have evidence suggesting deliberate afforestation attempts (planted or prepared to promote tree establishment) to convert to forest the prior inventory cycle or prior to the last measurement.

When collected:	When SAMPLE KIND = 2 and CONDITION CLASS STATUS = 1 or 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	No
	1	Yes

Item 5.8.2.6 TOTAL STEMS (CORE 2.5.33)
[COND.NBR_LIVE_STEMS]

Record TOTAL STEMS when CURRENT AFFORESTATION CODE = 1 or PREVIOUS AFFORESTATION CODE = 1. When CANOPY COVER SAMPLE METHOD = 1, conduct a stem count of live tally tree species within either the single one acre plot or four quarter acre plots and record the number counted. When CANOPY COVER SAMPLE METHOD = 3 or 5, record the number of live stems per acre based on the number of trees tallied in the stocking calculator.

When collected:	CURRENT AFFORESTATION CODE = 1 or PREVIOUS AFFORESTATION CODE = 1
Field width:	5 digits
Tolerance:	10%
Values:	00000 - 99999

Item 5.8.2.7 STOCKING PERCENT (AFSL, PFSL)
[COND.STOCKING_PCT_PNWRS]

Record the total percentage of stocking for the cover subplot(s). Manually enter the value of the computed total from the stocking/cover calculator in the PDR (round down to the nearest percent).

When collected:	All CONDITION CLASS STATUS = 1 or 2 and CANOPY COVER SAMPLE METHOD > 1
Field width:	2 digits
Tolerance:	No errors
Values:	01 to 99

Item 5.8.2.8 STOCKING MAXIMUM DBH/DRC (AFSL, PFSL)
[COND.STOCKING_MAX_DBH_CD_PNWRS]

Record a code describing the largest diameter at breast height (DBH) or diameter at root collar (DRC) of any tree within the established cover subplot area. This will determine which stocking values are used in the stocking/cover calculator in the PDR. If you need to update this value while collecting stocking data, the PDR will automatically re-compute stocking values in the stocking/cover calculator.

When collected:	All CONDITION CLASS STATUS = 1 or 2 and CANOPY COVER SAMPLE METHOD > 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Largest DBH/DRC is a seedling
	2	Largest DBH/DRC is between 1.0-1.9 inches
	3	Largest DBH/DRC is between 2.0-2.9 inches
	4	Largest DBH/DRC is between 3.0-3.9 inches
	5	Largest DBH/DRC is between 4.0-4.9 inches
	6	Largest DBH/DRC is 5.0 inches or above

Item 5.8.2.9 COVER PLOT NOTES (AFSL, PFSL)
[COND.NOTES]

Record notes pertaining to a stocking plot as needed to explain or describe the plot or condition. Include any COVER PLOT NOTES in the electronic CONDITION CLASS NOTES (Item 5.10.1.2) field (a separate field for COVER PLOT NOTES is not available).

When collected:	All cover plots
Field width:	2000 characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

SUBSECTION 5.8.3 COVER TREE DATA ITEMS

For every tree within a cover subplot area, collect the data items in this subsection. Only include dead trees and stumps if you would have used them on a normal stocking subplot in previous years (or those that appear to be less than 30 years old if you are not sure of previous practice). For the purpose of this study, the definition of a tree includes seedlings and saplings.

As trees are entered into the PDR stocking/cover calculator, STOCKING PERCENT and LIVE PLUS MISSING CANOPY COVER will be computed and displayed in the data recorder. Once the STOCKING PERCENT and LIVE PLUS MISSING CANOPY COVER both reach 25 percent, additional trees do not need to be collected.

Item 5.8.3.1 COVER SUBPLOT (AFSL, PFSL)
[STOCKING_TREE_PNWRS.SUBP]

Record the COVER SUBPLOT that trees are collected on. When using the single 118-foot circle, stocking subplot 1 (code 1) is the only valid entry.

When collected:	When CANOPY COVER SAMPLE METHOD > 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Cover subplot 1
	2	Cover subplot 2
	3	Cover subplot 3
	4	Cover subplot 4

Item 5.8.3.2 CONDITION CLASS NUMBER (AFSL, PFSL)
[STOCKING_TREE_PNWRS.CONDID]

Record the CONDITION CLASS NUMBER each cover tree represents.

When Collected:	All cover trees
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 5.8.3.3 COVER TREE STATUS (AFSL, PFSL)
[STOCKING_TREE_PNWRS.STOCKING_TREE_STATUS]

Record the COVER TREE STATUS for every stocking and cover tree.

When collected:	When CANOPY COVER SAMPLE METHOD > 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Live tree
	2	Dead tree
	3	Stump

Item 5.8.3.4 OVER TOPPED STATUS (AFSL, PFSL)
[STOCKING_TREE_PNWRS.OVER_TOP_STATUS]

Record the over topped status for every stocking and cover tree. Note that live trees may be over topped by recently dead trees and/or trees rooted outside the single, fixed-area one acre plot or any of the four fixed-area quarter acre subplots.

When collected:	When CANOPY COVER SAMPLE METHOD > 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	A portion of crown or missing crown is over topped
	2	No piece of the crown or missing crown is over topped

Item 5.8.3.5 COVER TREE SPECIES (AFSL, PFSL)
[STOCKING_TREE_PNWRS.SPCD]

Record the COVER TREE SPECIES. The tree species in the table below do not have a stocking equation; enter the species code for ponderosa pine (122) to use the stocking values for ponderosa pine and put the actual species in the COVER TREE NOTES field.

Note: the surrogate, ponderosa pine, is derived from information in the 2001 report.

“National Algorithms for Determining Stocking Class, Stand Size Class, and Forest Type for Forest Inventory and Analysis Plots”.

Tree Species not in Stocking Tables	
Name	Code
Border pinyon	134
Mexican pinyon pine	140
Great Basin bristlecone pine	142
Gamble oak	814
New Mexico locust	902
Tesota, Arizona ironwood	990

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	3 digits
Tolerance:	No errors
Values:	Appendix D, FIA Tree Species Codes

Item 5.8.3.6 COVER TREE DIAMETER (AFSL, PFSL)
[STOCKING_TREE_PNWRS.DIA]

Record the COVER TREE DIAMETER to the nearest 0.1 inch. Use normal methods for measuring DBH and DRC.

Diameter point of measurement monumentation is not required on cover trees. If you suspect the cover tree will become a tally tree, insert a nail at diameter point of measurement.

Stumps: enter the diameter that you measure. Diameter for a stump is the average of two width measurements perpendicular to each other, across the top of the stump at the cut location, regardless of how high the stump is, unless it is a tally tree. The PDR program will automatically use a taper equation to estimate diameter at breast height based on the value entered into this data item. If you are calculating stocking on paper, remember to subtract two inches from your measured stump diameter (on DBH trees). DBH measured as 2.9 inches becomes 0.1 inches (a seedling).

Seedlings: enter the diameter as 0001.

Woodland species: use the DRC calculator the PDR to calculate DRC.

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	4 digits
Tolerance:	Same as tree tally diameter
Values:	000.1 and 001.0 to 999.9

SUBSECTION 5.8.4 CROWN MEASUREMENTS

Crown measurements will be taken as a “long” crown width and a “short” crown width. Measure COVER TREE LONG CROWN WIDTH where the crown is the widest, from the drip line at one edge to the drip line at the other edge. Make the second measurement (COVER TREE SHORT CROWN WIDTH) at the widest portion of the crown perpendicular to the “long” crown width axis. Use the same procedures described above. Determine drip line end points by projecting where crown edge branch tips would hit the ground if they fell. Occasionally, a branch may protrude abnormally, but the crown line is drawn across the portion of the branch which includes the “normal outline” of the tree. It is helpful to use a clinometer to measure a line perpendicular to the ground. If you cannot see the crown edge from directly beneath the drip line, move away from the tree to make your estimate. Do not combine crowns of single stem trees that overlap or are overtopped by another tree. All measurements are rounded to the nearest foot. See Figure 5.20: LONG CROWN WIDTH is measured on the widest portion of the crown, as seen from above. SHORT CROWN WIDTH is the widest portion of the crown perpendicular to the LONG CROWN WIDTH axis., and Figure 5.21: Leaning tree crown width measurements, for examples of how to measure crowns. If portions of the tree crown are overtopped by an adjacent tree or trees rooted either inside or outside the single fixed-area one acre plot or one of the four fixed-area quarter acre subplots, additional measurements are required of the COVER TREE LONG CROWN WIDTH, non overtopped portion and the COVER TREE SHORT CROWN WIDTH, non-overtopped portion. These will be used to calculate condition-level canopy cover.

Crown measurements are required for dead trees and stumps. Use neighboring live trees in the condition of the same species and of similar diameter and/or height to estimate crown lengths and widths. When there are no live trees in the condition because of a clearcut or burn, go to an adjacent stand of similar composition.

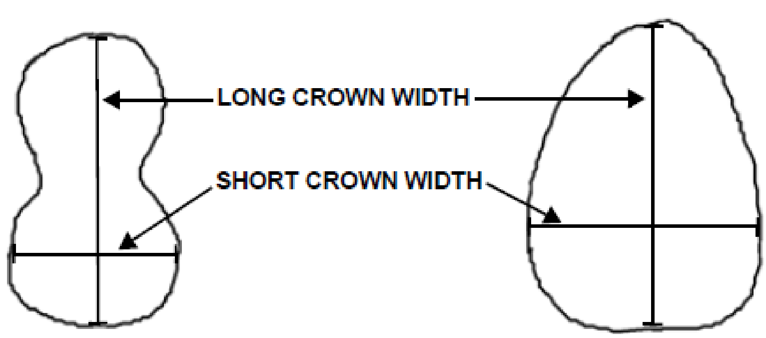


Figure 5.20: LONG CROWN WIDTH is measured on the widest portion of the crown, as seen from above. SHORT CROWN WIDTH is the widest portion of the crown perpendicular to the LONG CROWN WIDTH axis.

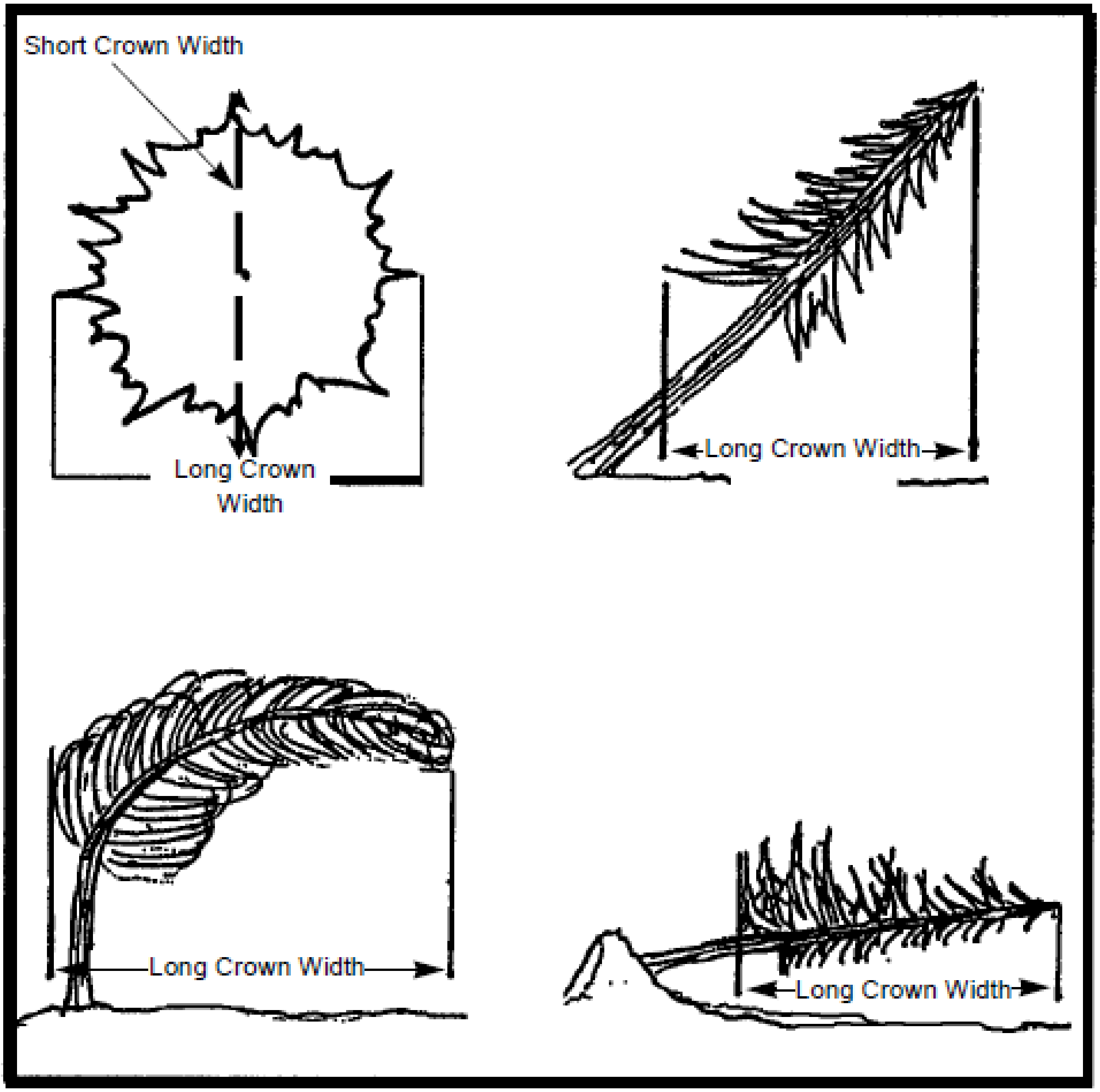


Figure 5.21: Leaning tree crown width measurements

Item 5.8.4.1 COVER TREE COMMINGLED CROWN CODE (AFSL, PFSL)
[STOCKING_TREE_PNWRS.COMINGLED_CRWN_CD]

Use this code when it is not possible to accurately measure the crowns of individual trees in a multi-stemmed tree (e.g., a canyon live oak that forks into three trees) or in a clump of trees. Record the same numeric code for each stem in a multi-stemmed tree or clump. Assign code “01” to all stems in the first multi-stemmed tree or clump, and number consecutively as additional multi-stemmed trees or clumps are encountered. Only the first tree in each commingled crown code group will have the crown widths recorded (measure the entire crown including all of the trees). This alleviates field crews from estimating crown widths of closely clumped trees. Enter “00” if each tree’s crown is distinct and can be measured individually.

Do not use this code on crowns of single stem trees that overlap (e.g., a seedling crown is overtopped by a neighboring tree crown). Be careful not to combine species (e.g., canyon live oak and interior live oak) within a commingled crown group.

Also use this code for seedlings of the same species (but not saplings or trees) when it increases the quality of the crown cover estimate. There are two situations that might cause one to do this: 1) an actual clump of seedlings makes it difficult to accurately measure each individual crown (and non-overtopped portion), and 2) Because crown diameters are measured to the nearest foot, numerous scattered seedlings with crowns <1 foot diameter would sum to a highly biased cover. Crews will use the commingled crown coding scheme and group seedlings together using an ocular estimate of crown cover. Note that this "group" of seedlings must form an imaginary circle (not a square) and that the diameters of the long crown length and short crown length must be given. It takes 4 seedlings with a 0.5 foot crown width to equal the cover of one seedling with a 1.0 foot crown width.

Note: This variable does not apply to woodland species because DRC stocking is computed using the calculated DRC, not each individual stem's diameter.

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	2 digits
Tolerance:	N/A
Values:	00-99

Item 5.8.4.2 COVER TREE LONG CROWN WIDTH (CROWN LENGTH) (AFSL, PFSL)
[STOCKING_TREE_PNWRS.CRWN_WIDTH_LONG]

Record the cover tree crown width measured at the widest part of the crown. Measurements are taken to the nearest foot from one edge of the crown to the other edge of the crown.

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	2 digits
Tolerance:	N/A
Values:	01-99

Item 5.8.4.3 COVER TREE SHORT CROWN WIDTH (CROWN WIDTH) (AFSL, PFSL)
[STOCKING_TREE_PNWRS.CRWN_WIDTH_SHORT]

Record the cover tree crown width measured at the widest point of the crown that is perpendicular to the long crown width measurement, to the nearest foot.

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	2 digits
Tolerance:	N/A
Values:	01-99

Item 5.8.4.4 COVER TREE LONG CROWN WIDTH, non-over topped portion (AFSL, PFSL)
[STOCKING_TREE_PNWRS.CRWN_WIDTH_NON_OVER_LONG]

Record the cover tree crown width at its widest point that is not over topped to the nearest foot. Measure between the non-overtopped edges along the same axis as the LONG CROWN WIDTH was measured.

When collected:	When CANOPY COVER SAMPLE METHOD > 1 and OVER TOPPED STATUS = 1
Field width:	2 digits
Tolerance:	N/A
Values:	00-99, 0 when 100 percent overtopped

Item 5.8.4.5 COVER TREE SHORT CROWN WIDTH, non-over topped portion (AFSL, PFSL)
[STOCKING_TREE_PNWRS.CRWN_WIDTH_NON_OVER_SHORT]

Record the cover tree crown width at its shortest point that is not over topped to the nearest foot. Measure between the non-overtopped edges along the same axis as the SHORT CROWN WIDTH was measured.

When collected:	When CANOPY COVER SAMPLE METHOD > 1 and OVER TOPPED STATUS = 1
Field width:	2 digits
Tolerance:	N/A
Values:	00-99, 0 when 100 percent overtopped

Item 5.8.4.6 COVER TREE STOCKING CONTRIBUTION (AFSL, PFSL)
[STOCKING_TREE_PNWRS.STOCK_CONTRB]

The value of a single tree's contribution to stocking will be computed based on the STOCKING MAXIMUM DBH code and the tree's species and diameter for the combined area of the cover plots used. This value is automatically computed by the stocking/cover calculator in the data recorder. This value will not be computed until the STOCKING MAXIMUM DBH (Item 5.8.2.8) is entered.

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	5 digits (x.yyy)
Tolerance:	N/A
Values:	0.001 to 4.000 percent

Item 5.8.4.7 COVER TREE COVER CONTRIBUTION (AFSL, PFSL)
[STOCKING_TREE_PNWRS.COVER_CONTRB]

The value of a single tree's contribution to percent cover will be computed based on the non-overtopped crown width measurements. The area of an ellipse is computed from the non-over topped crown widths and will be divided by the cover plot area to produce the cover percentage. This value is automatically computed by the stocking/cover calculator in the data recorder.

When collected:	When CANOPY COVER SAMPLE METHOD > 1
Field width:	5 digits (xx.yy)
Tolerance:	N/A
Values:	00.00 to 18.00 percent

Item 5.8.4.8 COVER TREE NOTES (AFSL, PFSL)
[STOCKING_TREE_PNWRS.NOTES]

Record notes pertaining to an individual stocking tree.

When Collected:	All stocking trees as necessary
Field width:	2000 characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

SECTION 5.9 NONSAMPLED CONDITION CLASS ATTRIBUTES

When encountering an area where CONDITION NONSAMPLED REASON (Item 5.9.0.1) is constant but attributes differ, record attributes that apply to the greater part of the area within the nonsampled condition class.

For entirely nonsampled plots with multiple nonsampled reasons, code the nonsampled reason that applies to the majority of the area of the plot footprint.

Example: Subplot center is accessible forestland, but there is a hazardous area delineated on the macroplot.

RESERVED STATUS, OWNER GROUP, GROUND LAND CLASS, and NONSAMPLED FOREST TYPE will be recorded for the nonsampled condition. If there is an ownership boundary between two OWNER GROUPS on plot within the nonsampled area, the difference in OWNER GROUP is ignored and the OWNER GROUP is assigned based on the condition that covers more area on the macroplot.

Item 5.9.0.1 CONDITION NONSAMPLED REASON (CORE 2.4.4)
[COND.COND_NONSAMPLE_REASN_CD]

<u>For portions of plots that cannot be sampled (CONDITION CLASS STATUS = 5), record one of the following reasons.</u>

When collected:	When CONDITION CLASS STATUS = 5		
Field width:	2 digits		
Tolerance:	No errors		
MQO:	At least 99% of the time		
Values:	Code	Nonsampled Reason	Core code (office use only)
	01	Outside U.S. boundary – Assign this code to condition classes beyond the U.S. border.	01
	02	Denied access area – Any area within the sampled area of a plot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. There are no minimum area or width requirements for a condition class delineated by denied access. Because a denied-access condition can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.	02
	03	Hazardous situation – Any area within the sampled area on plot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present. There are no minimum size or width requirements for a condition class delineated by a hazardous condition.	03
	06	Lost plot - Entire plot cannot be found. Used for the single condition that is required for this plot. Used only in conjunction with PLOT NONSAMPLED REASON code 06. Can be either generated by the data recorder or in the office.	06
	08	Skipped visit - Entire plot skipped. Used for the single condition that is required for this plot. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 08.	08
	10	Other – This code is used whenever a condition class is not sampled due to a reason other than one of the specific reasons listed. A*n electronic CONDITION CLASS NOTE* is required to describe the situation.	10
	20	Off-grid – Not on Forest Service administered lands or BLM lands within the Western Oregon BLM timberlands inventory area (i.e. plot is part of an intensified sample [not on the FIA grid] and the condition class is not located on Forest Service administered lands [ADMINISTRATIVE FOREST CODE = null] or BLM lands within the Western Oregon BLM timberlands inventory [BLM RESOURCE AREA is not null and OWNER CLASS <> 22]). For plots that are part of the Oregon Department of Forestry intensification, record for the condition class that is not located on ODF lands.	10

Item 5.9.0.2 PREVIOUS CONDITION NONSAMPLED REASON (PNW)
[PREV_COND_PNWRS.COND_NONSAMPLE_REASN_CD]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record one of the following reasons for portions of the plot which could not be sampled at the previous measurement (PREVIOUS CONDITION CLASS STATUS = 5). Note: PREVIOUS CONDITION NONSAMPLED REASON values have already been updated to current codes.

When collected:	When SAMPLE KIND = 2 and PREVIOUS CONDITION CLASS STATUS = 5
Field width:	2 digits
Tolerance:	No errors
Values:	see CONDITION NONSAMPLED REASON

Item 5.9.0.3 NONSAMPLED FOREST TYPE (PNW)
[COND.FLDTYPCD_NON_SAMP_PNWRS]

Record the forest type of the nonsampled condition with the potential to be forest land, within the Area of Observation.

For entirely nonsampled plots: If multiple condition classes would be delineated if ground visited, assess FOREST TYPE of the forested/potentially forested condition class (that would be delineated if ground visited) with the majority of area on the plot footprint using current and historical imagery, previous data, and local knowledge.

When collected:	When CONDITION CLASS STATUS = 5
Field width:	3 digits
Tolerance:	No errors
Values:	See Appendix E, Forest Type Codes

SECTION 5.10 CONDITION CLASS NOTES

SUBSECTION 5.10.1 CONDITION CLASS NOTES

Item 5.10.1.1 PREVIOUS CONDITION CLASS NOTES (PNW)
[PREV_COND_PNWRS.NOTES]

Downloaded notes from the previous inventory that cannot be updated.

When collected:	All plots when previous crew incorrectly recorded condition class variables and previous values were changed by current crew
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

Item 5.10.1.2 CONDITION CLASS NOTES (PNW)
[COND.NOTES]

Record any notes needed to clarify or explain a special situation in the particular condition class being defined.

Record any notes needed to clarify or explain changes between current and previous condition class data items or condition class mapping. Provide an explanation describing why values were changed. If an error was made, include what was determined to be wrong and describe, in detail, the reason the current crew knows a previous error was made.

When collected:	All plots, use when clarification is needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

Item 5.10.1.3 CHANGE MATRIX NOTES (PNW)
[CHANGE_MATRIX_PNWRS.NOTES]

Record any notes needed to explain physical change, procedural change, or previous crew error in CONDITION CLASS STATUS, RESERVED STATUS, and OWNER GROUP.

When collected:	CONDITION CLASS STATUS RECONCILE CODE = 1 or 3, CONDITON CLASS STATUS PROCEDURAL CHANGE REASON CODE = 99, RESERVED STATUS RECONCILE CODE = 1 or 3, RESERVED STATUS PROCEDURAL CHANGE REASON CODE = 99, and OWNER GROUP RECONCILE CODE = 1 or 3, OWNER GROUP PROCEDURAL CHANGE REASON CODE = 99.
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

CHAPTER 6 SUBPLOT INFORMATION

Each subplot/*macroplot* is described by a series of area parameters relating to topographic features and existing cover type. These data also relate to the microplot, since the microplot is contained within the subplot perimeter. This information is used for a variety of topics, including: identifying potential limits to management (e.g., topography), and relating physical site features to forest composition and productivity.

SECTION 6.1 RECORDING SUBPLOT INFORMATION

SUBSECTION 6.1.1 SUBPLOT INFORMATION

Item 6.1.1.1 SUBPLOT NUMBER (CORE 3.1)

[SUBPLOT.SUBP]

Record the code corresponding to the number of the subplot.

When Collected:	All subplots	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 6.1.1.2 PREVIOUS SUBPLOT MAPPING ERROR (AFSL, PFSL)

[SUBPLOT.PREV_COND_MAP_ERROR_PNWRS]

Record a code to indicate whether or not a previous mapping error exists on a subplot or if an error exists in PREVIOUS SUBPLOT/MACROPLOT CENTER CONDITION or PREVIOUS MICROPLOT CENTER CONDITION. If PREVIOUS SUBPLOT MAPPING ERROR = Y, a note must be entered in SUBPLOT NOTES explaining why the crew knows an error was made previously.

When collected:	SAMPLE KIND = 2 and PREVIOUS DATA CORRECTABLE = Y	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	N	No error on subplot
	Y	Error on subplot

Item 6.1.1.3 SUBPLOT/MACROPLOT STATUS (CORE 3.4)

[SUBPLOT.SUBP_STATUS_CD]

Indicate whether or not this subplot/*macroplot* currently has at least one accessible forest land condition class. In situations where *PLOT STATUS = 1 or 2* and subplot/macroplot is denied access or hazardous, but obviously contains no forest land, record SUBPLOT/MACROPLOT STATUS = 2. In cases where a subplot/macroplot is access-denied or hazardous land use and has the possibility of forest, record SUBPLOT/MACROPLOT STATUS = 3.

When collected:	All subplots/*macroplots*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Sampled – at least one accessible forest land condition present on subplot/*macroplot*
	2	Sampled – no accessible forest land condition present on subplot/*macroplot*
	3	Nonsampled –*possibility of forest land*
	4	Sampled – *QA crew only measured condition, boundary and some subplot level data.* For use only on check plots (QA STATUS = 2 *through* 6). Not a legal entry on production plots (QA STATUS = 1 or 7).

Item 6.1.1.4 SUBPLOT/MACROPLOT NONSAMPLED REASON (CORE 3.5)
[SUBPLOT.POINT_NONSAMPLE_REASN_CD]

For entire subplots/*macroplots* that cannot be sampled, record one of the following reasons.

When collected:	When SUBPLOT/MACROPLOT STATUS = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Definition
	01	Outside U.S. boundary – Assign this code to condition classes beyond the U.S. border.
	02	Denied access area – Any area within the sampled area of a plot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. There are no minimum area or width requirements for a condition class delineated by denied access. Because a denied-access condition can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
	03	Hazardous situation – Any area within the sampled area on *a* plot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present. There are no minimum size or width requirements for a condition class delineated by a hazardous condition.
	04	Time limitation – This code applies to full subplots/*macroplots* that cannot be sampled due to a time restriction. This code is reserved for areas with limited access, and in situations where it is imperative for the crew to leave before the plot can be completed. *Time limitation may only be used as a subplot nonsampled reason code in situations where ALL of the following conditions are met: imperative for crew to leave before the plot can be completed; return to the site within 30 days of initial visit to sample remaining subplots is not feasible; and adding/adjusting resources or altering access route/method in future inventory years (i.e. carryover) will not result in successfully sampling all subplots/macroplots.* Use of this code requires *field supervisor/COR approval*. This code should not be used for an entire plot (use code 8 [skipped visit] when an entire plot is skipped; see Chapter 4, Plot Level Data). *If a crew decides that there is a possibility that "Time limitation" may need to be used, they must sample accessible subplots in sequential order, regardless of condition (i.e. forest or sampled non-forest), to prevent sampling bias.*
	06	Lost plot - Entire plot cannot be found. Used for the four subplots that are required for this plot. Used only in conjunction with PLOT NONSAMPLED REASON code 06. Can be either generated by the data recorder or in the office.
	08	Skipped visit - Entire plot skipped. Used for the four subplots that are required for this plot. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 08.
	10	Other – This code is used whenever a plot or condition class is not sampled due to a reason other than one of the specific reasons already listed. *An electronic SUBPLOT NOTE* is required to describe the situation.

Item 6.1.1.5 NONFOREST SUBPLOT/MACROPLOT STATUS (CORE 3.6)
[SUBPLOT.NF_SUBP_STATUS_CD]

Record the code that describes the sampling status of the other-than-forest subplot, i.e., SUBPLOT/MACROPLOT STATUS = 2. In cases where subplot is denied access or hazardous, but obviously contains no nonforest land, i.e., subplot is either noncensus water or Census water, *or where no measureable nonforest exists*, record NONFOREST SUBPLOT/MACROPLOT STATUS = 2.

When collected:	When NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Sampled - at least one accessible *measurable* nonforest land condition present on the subplot.
	2	Sampled - no nonforest land condition present on subplot, i.e., subplot is either census and/or noncensus water *or no measurable nonforest condition present*.
	3	Nonsampled nonforest

Item 6.1.1.6 NONFOREST SUBPLOT/MACROPLOT NONSAMPLED REASON (CORE 3.7)
[SUBPLOT.NF_SUBP_NONSAMPLE_REASN_CD]

For entire nonforest subplots that can not be sampled, record one of the following reasons.

When collected:	When NONFOREST SUBPLOT/MACROPLOT STATUS = 3	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	02	Denied access - A subplot/macroplot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. Because a denied-access subplot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
	03	Hazardous situation - A subplot/macroplot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present.
	04	Time limitation – This code applies to full subplots/macroplots that cannot be sampled due to a time restriction. This code is reserved for areas with limited access, and in situations where it is imperative for the crew to leave before the plot can be completed. *Time limitation may only be used as a subplot nonsampled reason code in situations where ALL of the following conditions are met: imperative for crew to leave before the plot can be completed; return to the site within 30 days of initial visit to sample remaining subplots is not feasible; and adding/adjusting resources or altering access route/method in future inventory years (i.e. carryover) will not result in successfully sampling all subplots/macroplots.* Use of this code requires *field supervisor/COR approval. This code should not be used for an entire plot (use code 8 [skipped visit] when an entire plot is skipped; see Chapter 4, Plot Level Data). If a crew decides that there is a possibility that "Time limitation" may need to be used, they must sample accessible subplots in sequential order, regardless of condition (i.e. forest or sampled non-forest), to prevent sampling bias.*
	10	Other - This code is used whenever a subplot/macroplot is not sampled due to a reason other than one of the specific reasons already listed. *An electronic SUBPLOT NOTE* is required to describe the situation.

Item 6.1.1.7 PREVIOUS SUBPLOT/MACROPLOT CENTER CONDITION (PNW)
[SUBPLOT.PREV_SUBPCOND_PNWRS]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the CONDITION CLASS NUMBER of the condition class at the subplot/macroplot center as it existed at the previous measurement. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	When SAMPLE KIND = 2
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 6.1.1.8 SUBPLOT/MACROPLOT CENTER CONDITION (CORE 3.8)
[SUBPLOT.SUBPCOND]

Record the CONDITION CLASS NUMBER of the condition class at the subplot center.

When collected:	All subplots
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 6.1.1.9 SUBPLOT/MACROPLOT CONDITION LIST (CORE 3.13)
[SUBPLOT.CONDLIST]

This is a listing of all condition classes located within the 58.9-foot radius around the *subplot/*macroplot center. A maximum of four conditions is permitted at any individual subplot/macroplot *(a maximum of nine condition classes can be recorded on a plot)*. If a condition class has already been defined at a previously completed subplot/macroplot, use the same condition class number whenever that condition is encountered. Define new condition classes as they are encountered. If more than one condition class is listed here, boundary data are required. If only one condition class is listed, this condition is automatically assigned to the subplot center and microplot center. If *fewer* than four condition classes occur on this subplot, complete the remainder of this field with zeros. For example, if condition 1 is the only condition class on a subplot, record 1000.

When collected:	All plots
Field width:	4 digits
Tolerance:	No errors
Values:	1000 to 9876

Item 6.1.1.10 MICROPLOT CENTER CONDITION (CORE 3.9)
[SUBPLOT.MICRCOND]

Record the CONDITION CLASS NUMBER of the condition class at the microplot center.

When collected:	All microplots
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 6.1.1.11 PREVIOUS MICROPLOT CENTER CONDITION (PNW)
[SUBPLOT.PREV_MICRCOND]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the CONDITION CLASS NUMBER of the condition class at the microplot center as it existed at the previous measurement. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 6.1.1.12 P2 VEG SUBPLOT SAMPLE STATUS (CORE OPTIONAL 3.14)
[SUBPLOT.P2VEG_SUBP_STATUS_CD]

Record the code to indicate if the subplot was sampled for P2 vegetation. A subplot may be sampled for P2 Vegetation but not have any vascular plants present. If there is any part of an accessible portion of the subplot where other plot measurements are made but **all** the P2 Vegetation measurements cannot be completed on the subplot (for example, deep snow or water), enter code 2 and do not record **any** P2 Vegetation measurements.

When collected:	On all subplots where P2 vegetation is being sampled on accessible forest land (P2 VEGETATION SAMPLING STATUS = 1) and at least one accessible forest land condition (CONDITION CLASS STATUS = 1) exists within the 24-foot radius subplot, or P2 Vegetation is being sampled on all accessible land conditions (P2 VEGETATION SAMPLING STATUS = 2) and at least one accessible forest condition or accessible, measurable nonforest condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) exists within the 24-foot radius subplot.	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Subplot sampled for P2 Vegetation
	2	Subplot not sampled for P2 Vegetation

Item 6.1.1.13 VEGETATION NONSAMPLED REASON (CORE OPTIONAL 3.15)
[SUBPLOT.P2VEG_SUBP_NONSAMPLE_REASN_CD]

Record the reason why P2 vegetation on a subplot cannot be sampled.

When collected:	On all subplots where P2 VEG SUBPLOT SAMPLE STATUS = 2	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Definition
	05	Lost data (for office use only)
	10	Other (for example, snow or water covering vegetation that is supposed to be sampled). *Record an explanation in SUBPLOT NOTES.*

Item 6.1.1.14 INVASIVE PLANT SUBPLOT SAMPLE STATUS (CORE OPTIONAL 3.17)
[SUBPLOT.INVASIVE_SUBP_STATUS_CD]

Record the code to indicate whether the subplot was sampled for invasive plants. A subplot may be sampled but not have any invasive plants present. If there is any part of an accessible portion of the subplot where other plot measurements are made but invasive plants can't be assessed (e.g., because of snow, water), enter code 3 and do not record any invasive plant measurements.

When collected:	On all subplots where invasive species are being sampled on accessible forest land (INVASIVE PLANT SAMPLING STATUS = 1) and at least one accessible forest land condition (CONDITION CLASS STATUS = 1) exists within the 24-foot radius subplot or invasive species are being sampled on all accessible land conditions (INVASIVE PLANT SAMPLING STATUS = 2) and at least one accessible forest condition or accessible, measurable nonforest condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) exists within the 24-foot radius subplot	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Subplot sampled, invasive plants present
	2	Subplot sampled, no invasive plants present
	3	Subplot not sampled for invasive plants

Item 6.1.1.15 INVASIVE PLANT NONSAMPLED REASON (CORE OPTIONAL 3.18)
[INVASIVE_PLOT_SPECIES.SPECIMEN_NOT_COLLECTED_REASON]

Record the reason why a subplot cannot be sampled for invasive plants.

When collected:	On all subplots where INVASIVE PLANT SUBPLOT SAMPLE STATUS = 3	
Field width:	2 digit	
Tolerance:	No errors	
Values:	Code	Location
	5	Lost Data (office use only)
	10	Other (for example, snow or water covering vegetation that is supposed to be sampled*, explanation required in SUBPLOT NOTES*)

Item 6.1.1.16 SUBPLOT/MACROPLOT MONUMENT FOUND (CORE OPTIONAL 3.2)

Remeasurement (SAMPLE KIND = 2) locations only. Record a code to indicate if the previously placed subplot/macroplot monument (pin stake or other) was found as established by the prior crew. If a subplot/macroplot was not previously monumented, use code 0.

When collected:	When collected: SAMPLE KIND = 2 and either NONFOREST SAMPLING STATUS = 0 and SUBPLOT/MACROPLOT STATUS = 1, 2, or 4 or NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 1 or 4 or NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 2 and NONFOREST SUBPLOT/MACROPLOT STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	Previous subplot/microplot monument was not placed, was not found, or was found displaced
	1	Previous subplot/microplot monument was found in its established location

Item 6.1.1.17 MICROPLOT MONUMENT FOUND (CORE OPTIONAL 3.3)

Remeasurement (SAMPLE KIND = 2) locations only. Record a code to indicate if the previously placed microplot monument (pin stake or other) was found as established by the prior crew. If a microplot was not previously monumented, use code 0.

When collected:	When collected: SAMPLE KIND = 2 and either NONFOREST SAMPLING STATUS = 0 and SUBPLOT/MACROPLOT STATUS = 1, 2, or 4 or NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 1 or 4 or NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 2 and NONFOREST SUBPLOT/MACROPLOT STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	Previous microplot monument was not placed, was not found, was found displaced, or would occupy a nonsampled area
	1	Previous microplot monument was found in its established location

SUBSECTION 6.1.2 UNLISTED TREES

Item 6.1.2.1 UNLISTED TREE PRESENT (CORE 3.20)

The Master Species List is the result of consultations among arborists, foresters, and forest specialists around the Nation. It is a comprehensive list that will account for the majority of tree form species that crews may encounter in the field. However, it is still possible for crews to encounter a species with tree-like growth form that was unintentionally OR intentionally excluded from the list. For example, when local environmental conditions cause the growth form of a species to present as a woody plant with a single well-defined, dominant main stem with a DBH/DRC of at least 5.0 inches. The purpose of this variable is to provide information on such species to further refine the species list in future inventories.

An UNLISTED TREE is defined as a live tree that is at least 5.0 inches DBH located within a subplot that is not listed in Appendix 3 OR is listed but is found within an Island, Mainland, or P2/3 Sub-list where it is not a legal tally tree.

The diameter standard switches to DRC for those DRC species on the list that are found in an Island, Mainland, or P2/3 Sub-list where they are not a legal tally. In order for these DRC species to qualify, they must have at least one 5-inch diameter stem. If it is a multiple stem DRC tree and it has 2 qualifying stems, it is only recorded as one tree.

Record the presence of any UNLISTED TREEs found on the subplot/macroplot when SUBPLOT/MACROPLOT STATUS = 1 or NONFOREST SUBPLOT/MACROPLOT STATUS = 1 regardless of the specific condition in which the unlisted tree is located.

When collected:	When SUBPLOT/MACROPLOT STATUS = 1 or NONFOREST SUBPLOT/MACROPLOT STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	No unlisted trees present.
	1	Unlisted tree present.

Item 6.1.2.2 UNLISTED TREE GENUS (CORE 3.21)

Record the genus for each UNLISTED TREE species encountered on the subplot.

When collected:	When UNLISTED TREE PRESENT = 1
Field width:	70 characters
Tolerance:	No errors
Values:	English language letters

Item 6.1.2.3 UNLISTED TREE SPECIES (CORE 3.22)

Record the species of each UNLISTED TREE GENUS recorded.

When collected:	When UNLISTED TREE PRESENT = 1
Field width:	70 characters
Tolerance:	No errors
Values:	English language letters

Item 6.1.2.4 UNLISTED TREE SPECIES COUNT (CORE 3.23)

Record the number of instances each UNLISTED TREE SPECIES is encountered on the subplot. Estimate counts over 10 individuals. If a species is found on a subplot and not present on another subplot, code 0 for any other subplots where it is not present.

When collected:	For each UNLISTED SPECIES encountered
Field width:	2 digits
Tolerance:	+/- 10 percent
Values:	0 to 99

Item 6.1.2.5 UNLISTED TREE NOTES (CORE 3.26)

Notes are required for each UNLISTED TREE SPECIES record. Enter text that describes the species or that explains why it was not collected if collection was required but not done. This text may be used on the specimen label and any spreadsheet used to track specimens. Use the notes section to provide any information about sources used to identify the species of the UNLISTED TREE.

PDR Note: Record this note while in the UNLISTED TREE SPECIES record. Press the "Ctrl"+"N".

Listed are some examples of why a specimen may not be collected:

- Species has less than 1% canopy cover on the subplot and no mature foliage or reproductive parts are present.
- Hazardous situation.
- Time limitation.
- Other (explain in notes).

When collected:	Required for each UNLISTED TREE SPECIES record
Field width:	Unlimited alphanumeric character field
Tolerance:	N/A
Values:	English language words, phrases, and numbers

SUBSECTION 6.1.3 PHYSIOGRAPHIC CLASS INFORMATION

Item 6.1.3.1 MACROPLOT PHYSIOGRAPHIC CLASS (PFSL)
[SUBPLOT.PHYSCLCD_PNWRS]

Record the code best describing the physiographic class of the macroplot. Land form, topographic position, and soil generally determine physiographic class. Look over the 58.9-foot radius macroplot area to determine MACROPLOT PHYSIOGRAPHIC CLASS.

When collected:	All subplots/macroplots with at least one accessible forest land condition class present on the subplot/macroplot (SUBPLOT/MACROPLOT STATUS = 1); **or** All subplots/macroplots with at least one accessible nonforest land condition class present on the subplot/macroplot when nonforest is being sampled (NONFOREST SUBPLOT/MACROPLOT STATUS = 1)
Field width:	2 digits
Tolerance:	No errors
Values:	See PHYSIOGRAPHIC CLASS (Item 5.7.2.10)

Item 6.1.3.2 SUBPLOT SLOPE (CORE 3.10)
[SUBPLOT.SLOPE]

Record the angle of slope across the *24.0-foot radius* subplot to the nearest 1-percent. SUBPLOT SLOPE is determined by sighting the clinometer along a line parallel to the average incline (or decline) of each subplot. This angle is measured along the shortest pathway down slope before the drainage direction changes. To measure SUBPLOT SLOPE, Observer 1 should stand at the uphill edge of the subplot and sight Observer 2, who stands at the downhill edge of the subplot. Sight Observer 2 at the same height as the eye-level of Observer 1. Read the slope directly from the percent*age* scale of the clinometer:

- If slope changes gradually across the subplot, record an average slope.
- If slope changes across the subplot but the slope is predominantly of one direction, code the predominant slope percentage rather than the average.
- If the subplot falls directly on or straddles a canyon bottom or narrow ridge top, code the average slope of the side hill(s).
- If the subplot falls on a canyon bottom or on a narrow ridge top, but most of the area lies on one side hill, code the slope of the side hill where most of the area lies.

When collected:	All subplots with at least one accessible forest land condition *class* present on subplot*/macroplot* (SUBPLOT/MACROPLOT STATUS = 1)*; **or*** *All subplots with at least one* accessible *measureable* nonforest condition class present *on the subplot/macroplot* when nonforest is being sampled NONFOREST SUBPLOT/MACROPLOT STATUS = 1)
Field width:	3 digits
Tolerance:	+/- 10 percent
Values:	000 to 155

Item 6.1.3.3 SUBPLOT ASPECT (CORE 3.11)
[SUBPLOT.ASPECT]

Record the aspect across the *24.0-foot radius* subplot, to the nearest 1 degree. SUBPLOT ASPECT is determined along the direction of slope for land surfaces with at least 5-percent slope in a generally uniform direction. SUBPLOT ASPECT is measured with a hand compass along the same direction used to determine slope.

- If aspect changes gradually across the subplot, record an average aspect.
- If aspect changes across the subplot but the aspect is predominately of one direction, code the predominate direction rather than the average.

- <u>If the subplot falls on or straddles a canyon bottom or narrow ridge top, code the aspect of the ridge line or canyon bottom.</u>
- <u>If the subplot falls on a canyon bottom or on a narrow ridge top, but most of the area lies on one side hill, code the aspect of the side hill.</u>

When collected:	All subplots with at least one accessible forest land condition *class* present on subplot*/macroplot* (SUBPLOT/MACROPLOT STATUS = 1)*;* ***or*** *All subplots with at least one* accessible *measurable* nonforest condition class present *on the subplot/macroplot when nonforest is being sampled (NONFOREST SUBPLOT/MACROPLOT STATUS = 1)*	
Field width:	3 digits	
Tolerance:	+/- 10 degrees	
Values:	Code	Definition
	000	no aspect, slope < 5- percent
	001	1 degree
	002	2 degrees
	.....	....
	360	360 degrees, due north

Item 6.1.3.4 SNOW/WATER DEPTH (CORE 3.12)
[SUBPLOT.WATERDEP]

<u>Record, to the nearest 0.1 foot, the average approximate depth of water or snow covering the *24.0-foot radius* subplot at the time of data collection. This *data item* is used to indicate subplots where some *data items* (e.g., seedling count, total lengths) may be measured with less certainty *because of* conditions at the time of measurement.</u>

This item is intended for water/snow/ice which covers substantial portions of subplots. Record “00” for streams contained within their banks and not affecting any measurements.

When collected:	All subplots with at least one accessible forest land condition *class* present on subplot*/macroplot* (SUBPLOT/MACROPLOT STATUS = 1)*;* ***or*** *All subplots with at least one* accessible *measurable* nonforest condition class present *on the subplot /macroplot* when nonforest is being sampled (NONFOREST SUBPLOT/MACROPLOT STATUS = 1)
Field width:	2 digits (x.y)
Tolerance:	+/- 0.5 feet
Values:	0.0 to 9.9

Item 6.1.3.5 SUBPLOT/MACROPLOT NOTES (PNW)
[SUBPLOT.NOTES]

Record any notes needed to clarify or explain a special situation encountered on the subplot.

When collected:	All plots: as needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

SECTION 6.2 ROOT DISEASE RATING

SUBSECTION 6.2.1 GUIDE FOR IDENTIFYING ROOT DISEASE

Root disease identification information can be found in Appendix M, Disease Keys.

SUBSECTION 6.2.2 ROOT DISEASE DATA ITEMS

Item 6.2.2.1 ROOT DISEASE SEVERITY RATING (PFSL)
[SUBPLOT.ROOT_DIS_SEV_CD_PNWRS]

The macroplot is assigned a ROOT DISEASE SEVERITY RATING in Oregon, Washington and California. Evaluate accessible forest land and measurable nonforest land area within the 58.9-foot radius macroplot boundary, and assign the ROOT DISEASE SEVERITY RATING best describing the degree of root disease severity present.

When assigning a ROOT DISEASE SEVERITY RATING, canopy reduction should be assessed as the proportion of the canopy cover within the macroplot that is no longer present due to root disease. Base the estimate of pre-existing canopy cover on field observations and current and historical aerial imagery as able.

When collected:	All subplots with at least one accessible forest land condition present on subplot/macroplot (SUBPLOT/MACROPLOT PLOT STATUS = 1); **or** All subplots with at least one *accessible nonforest condition class present* on the subplot/macroplot *when nonforest is being sampled (NONFOREST SUBPLOT/MACROPLOT STATUS = 1)*	
Field width:	1 digit	
Tolerance:	+/- 1 class	
Values:	Code	Root disease severity rating
	0	No evidence of root disease visible within 50 feet of the 58.9-foot macroplot.
	1	Root disease present within 50 feet of the macroplot, but no evidence of disease on the macroplot.
	2	Minor evidence of root disease on the macroplot, such as suppressed tree killed by root disease, or a minor part of the overstory showing symptoms of infection. Little or no detectable reduction in canopy closure or volume.
	3	Canopy reduction evident, up to 20-percent; usually as result of death of one codominant tree on an otherwise fully-stocked site. In absence of mortality, numerous trees showing symptoms of root disease infection.
	4	Canopy reduction at least 20-percent; up to 30-percent as a result of root disease mortality. Snags and downed trees removed from canopy by disease as well as live trees with advance symptoms of disease contribute to impact.
	5	Canopy reduction of 30- to 50-percent as a result of root disease. At least half of the ground area of macroplot considered infested with evidence of root disease-killed trees. Macroplots representing mature stands with half of their volume in root disease-tolerant species usually do not go much above severity “5” because of the ameliorating effect of the disease-tolerant trees.
	6	50- to 75-percent reduction in canopy with most of the ground area considered infested as evidenced by symptomatic trees. Much of the canopy variation in this category is generally a result of root disease-tolerant species occupying infested ground.

	7	At least 75-percent canopy reduction. Macroplots reaching this severity level usually are occupied by only the most susceptible species. There are very few of the original overstory trees remaining although infested ground is often densely stocked with regeneration of susceptible species.
	8	The entire macroplot falls within a definite root disease pocket with only one or very few susceptible overstory trees present.
	9	The entire macroplot falls within a definite root disease pocket with no overstory trees of the susceptible species present.

CHAPTER 7 BOUNDARY REFERENCES

SECTION 7.1 GENERAL INSTRUCTIONS

Boundary reference data are used to compute the area for the condition classes sampled on a plot and to remeasure plots. Record all boundaries between condition classes that occur within the sampled (fixed-radius) area on *microplots, subplots, and macroplots*. Boundaries outside sampled (fixed-radius) areas are not referenced.

In addition to using the recording procedures described herein, sketch maps of condition class boundaries onto the pre-printed plot diagrams on *the back of the plot card, accurately representing the shape of each boundary as it is on the ground (boundary data recorded in the PDR should represent the condition class area, but may not accurately represent the shape)*.

SECTION 7.2 REFERENCE PROCEDURE

Within the sampled area on each microplot, and macroplot, reference the approximate boundary of each condition class that differs from the condition class at *the* center. Trees selected on these fixed-radius plots are assigned to the actual condition in which they lie regardless of the recorded approximate boundary delineated.

Boundary referencing is done by recording azimuths and distances from subplot or microplot center to the reference points (Figure 7.1 and Figure 7.2). Each boundary is marked by a maximum of three points – two where the boundary intersects the *respective fixed-radius plot* circumference, and one "corner" point between the two end points, if necessary. Only the corner point requires a distance, since the distance from the center to the circumference is always equal to the fixed plot radius.

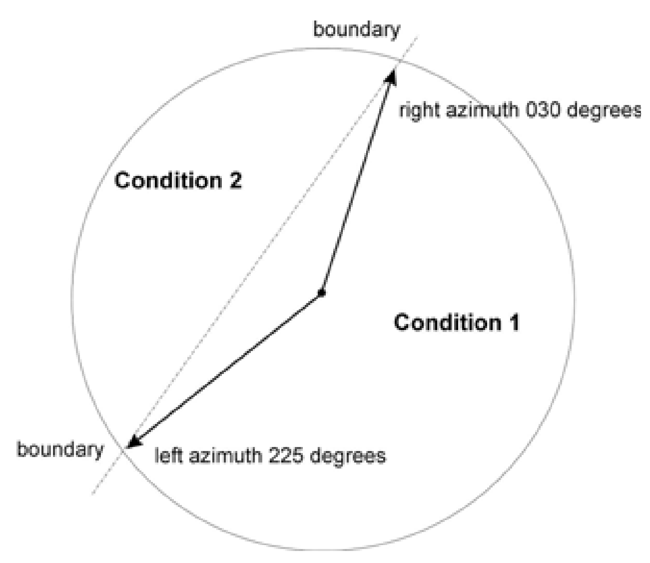


Figure 7.1: How to measure a straight boundary on a *fixed-radius plot*.

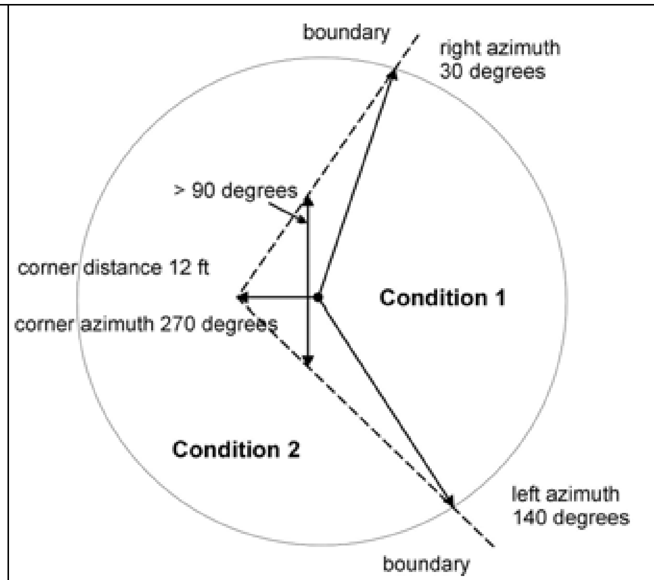


Figure 7.2: How to measure a boundary with a corner on a *fixed-radius plot*.

Microplot boundaries are referenced to the microplot center, and macroplot boundaries are referenced to the subplot center in the same manner described for subplots. Note that the larger the *fixed-radius* plot, the greater likelihood of a need for a boundary corner to record boundaries that are not straight lines.

Refer to Section 5.1 and *Section 5.3* for general condition class delineation guidelines. The following additional rules apply when referencing a boundary within a *fixed-radius plot*:

1. When a boundary between accessible forest land and nonforest land or between two contrasting accessible forest land condition classes is clearly marked, use that feature to define the boundary. Examples of clear demarcation are a fence line, plowed field edge, sharp ridge line, *defined stem line*, and water's edge along a stream course, ditch, or canal. Parcel lines on maps and images do not meet the clear demarcation standard.
2. When a boundary between forest land and nonforest land is not clearly marked by an obvious feature, the boundary should follow the nonforest side of the stems of the trees at the forest edge.

3. When a boundary between two contrasting forest land condition classes is not clearly marked, map along the stems of the contrasting condition. When the boundary between two contrasting forest land condition classes is separated by a narrow linear inclusion (creek, fire line, narrow meadow, unimproved road), establish the boundary at the far edge of the inclusion relative to subplot center.
4. Although individual tolerances are specified for the azimuths and distances, in practice a crew will be considered 'correct' when the difference in areas as mapped by the original crew and by the QA crew is less than 10 percent of the *fixed-radius plot* area. This allows for slight variations in azimuths or distances due to the approximate nature of mapping procedures.
5. Small developed nonforest land conditions and Nonsampled conditions (see Section 5.4) that are too small to represent accurately given electronic mapping limitations (e.g. only one corner) are diagramed using a 'wedge.' On the plot card, draw them as they actually exist on the ground. Boundary reference data should then be collected to map a wedge that accurately represents the area of the condition on each fixed-radius plot on which it exists. Remember the fixed radius plots overlap, so if the mapped condition is present fully within the boundaries of the 24.0 foot radius subplot, it also occupies area and must be mapped on the 58.9 foot radius annular plot. The outer edge of the wedge shall face the direction of the actual location of the nonforest or nonsampled condition on each fixed-radius plot.

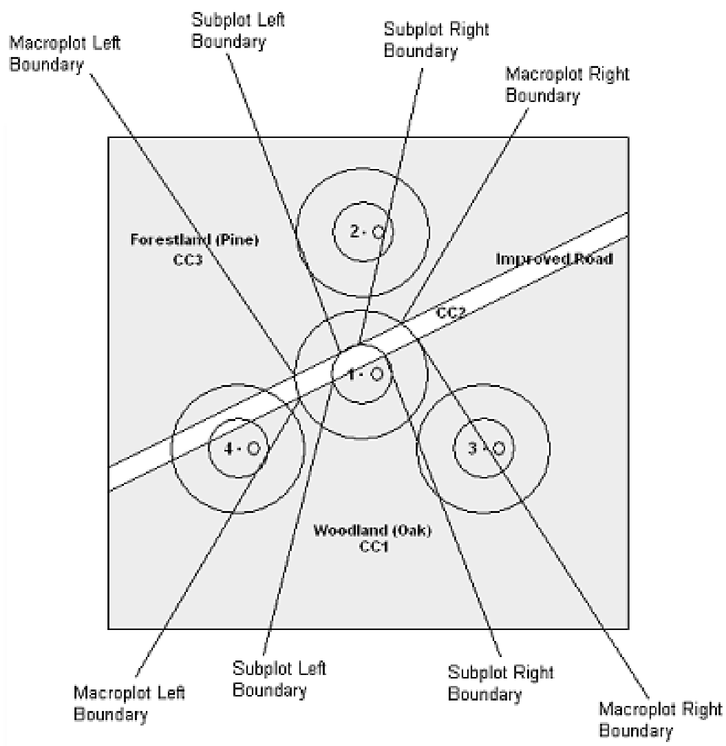


Figure 7.3: How to map subplot 1.

SUBSECTION 7.2.1 BOUNDARIES ON REMEASUREMENT PLOTS

When a plot is remeasured, the crew will examine the boundaries referenced at last inventory *and reassess the condition class delineating data items.* If no change has occurred, the current crew will retain the boundary data that were recorded at last inventory. If a boundary has changed, a new boundary is present, *a procedural change has altered the boundary,* or the previous crew made an obvious error; record new or updated boundary data. See Section 5.6, Condition Remeasurement for guidance on when to correct previous mapping error.Record the reason for the change in BOUNDARY CHANGE (Item 7.2.2.4). Delete boundaries that are no longer distinct. If in doubt about whether or not a boundary change has occurred, leave boundary as delineated at the previous inventory.

SUBSECTION 7.2.2 BOUNDARY DATA

Record the appropriate values for each boundary mapped on the subplot, microplot, or macroplot as follows:

Item 7.2.2.1 SUBPLOT NUMBER (CORE 4.2.1)
[BOUNDARY.SUBP]

Generated code corresponding to the number of the subplot.

When collected:	All boundaries	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 7.2.2.2 PLOT TYPE (CORE 4.2.2)
[BOUNDARY.SUBPTYP]

Record the code to specify whether the boundary data are for a subplot, microplot or macroplot.

When collected:	All boundaries	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Plot Type
	Null	No boundaries are recorded for the subplot
	1	Subplot boundary
	2	Microplot boundary
	3	Macroplot boundary

Item 7.2.2.3 PREVIOUS PLOT TYPE (PNW)
[PREV_BOUNDARY_PNWRS.SUBPTYP]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the code to specify whether the boundary data were recorded for a subplot, microplot or macroplot. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Plot Type
	Null	No boundaries are recorded for the subplot
	1	Subplot boundary
	2	Microplot boundary
	3	Macroplot plot boundary

Item 7.2.2.4 BOUNDARY CHANGE (CORE 4.2.3)
[BOUNDARY.BNDCHG]

Remeasurement (SAMPLE KIND = 2) locations only. Record the appropriate code to indicate the relationship between previously recorded and current boundary information.

When collected:	*When* SAMPLE KIND = 2
Field width:	1 digit
Tolerance:	No errors

Values:	0	No change, –boundary is the same as indicated on plot map and/or data collected by a previous crew.
	1	New boundary, or boundary data has been changed to reflect an actual on-the-ground physical change resulting in a difference from the boundaries recorded.
	2	Boundary has been changed to correct an error from previous crew.
	3	Boundary has been changed to reflect a change in variable definition.

Item 7.2.2.5 CONTRASTING CONDITION (CORE 4.2.4)
[BOUNDARY.CONTRAST]

Record the CONDITION CLASS NUMBER of the condition class that contrasts with the condition class located at the subplot center (for boundaries on the subplot or macroplot) or at the microplot center (for boundaries on the microplot), i.e., the condition class present on the other side of the boundary line.

When collected:	All boundaries
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 7.2.2.6 PREVIOUS CONTRASTING CONDITION (PNW)
[PREV_BOUNDARY_PNWRS.CONTRAST]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the CONDITION CLASS NUMBER of the condition class that contrasted with the condition class located at the subplot center at the previous measurement (for boundaries on the subplot, microplot, or macroplot), e.g., the condition class present on the other side of the boundary line. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 7.2.2.7 LEFT AZIMUTH (CORE 4.2.5)
[BOUNDARY.AZMLEFT]

Record the azimuth from the subplot, microplot or macroplot center to the farthest left point (facing the contrasting condition) where the boundary intersects the circumference.

When collected:	All boundaries
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	001 to 360

Item 7.2.2.8 PREVIOUS LEFT AZIMUTH (PNW)
[PREV_BOUNDARY_PNWRS.AZMLEFT]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the azimuth from the subplot, microplot, or macroplot center to the farthest left point (facing the contrasting condition class) where the boundary intersected the subplot, microplot, or macroplot circumference at the previous measurement. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	001 to 360

Item 7.2.2.9 CORNER AZIMUTH (CORE 4.2.6)
[BOUNDARY.AZMCORN]

Record the azimuth from the subplot, microplot or macroplot center to a corner or curve in a boundary. If a boundary is best described by a straight line between the two circumference points, then record 000 for CORNER AZIMUTH (000 = none).

When collected:	All boundaries
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	000 to 360

Item 7.2.2.10 PREVIOUS CORNER AZIMUTH (PNW)
[PREV_BOUNDARY_PNWRS.AZMCORN]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the azimuth from the subplot, microplot or macroplot center to a corner or curve in a boundary at the previous measurement. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	000 to 360

Item 7.2.2.11 CORNER DISTANCE (CORE 4.2.7)
[BOUNDARY.DISTCORN]

Record the horizontal distance, to the nearest 1 foot, from the subplot, microplot or macroplot center to a boundary corner point.

When collected:	All boundaries when CORNER AZIMUTH > 000	
Field width:	3 digits	
Tolerance:	+/- 1 foot	
Values:	Plot Type	Values for Corner Distance
	Microplot	001 to 007 feet (actual limiting distance is 6.8 feet)
	Subplot	001 to 024 feet
	Macroplot	001 to 059 feet (actual limiting distance is 58.9 feet)

Item 7.2.2.12 PREVIOUS CORNER DISTANCE (PNW)
[PREV_BOUNDARY_PNWRS.DISTCORN]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the horizontal distance as it should have been measured, to the nearest 1 foot, from the subplot, microplot or macroplot center to a boundary corner point. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2	
Field width:	3 digits	
Tolerance:	+/- 1 foot	
Values:	Plot Type	Values for Corner Distance
	Microplot	001 to 007 feet (actual limiting distance is 6.8 feet)
	Subplot	001 to 024 feet
	Macroplot	001 to 059 feet

Item 7.2.2.13 RIGHT AZIMUTH (CORE 4.2.8)
[BOUNDARY.AZMRIGHT]

Record the azimuth from the subplot, microplot or macroplot center to the farthest right point (facing the contrasting condition) where the boundary intersects the circumference.

When collected:	All boundaries
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	001 to 360

Item 7.2.2.14 PREVIOUS RIGHT AZIMUTH (PNW)
[PREV_BOUNDARY_PNWRS.AZMRIGHT]

A downloaded value that may be updated if an error was made by the previous crew. If updated, record the azimuth from the subplot, microplot, or macroplot center to the farthest right point (facing the contrasting condition class) where the boundary intersected the subplot, microplot, or macroplot circumference at the previous measurement. This code is only updateable when PREVIOUS DATA CORRECTABLE = Y.

When collected:	SAMPLE KIND = 2
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	001 to 360

Item 7.2.2.15 BOUNDARY NOTES (PNW)
[BOUNDARY.NOTES]

Record electronic BOUNDARY NOTES, if needed, to clarify or explain a special situation in the boundary being defined.

When collected:	As needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

Item 7.2.2.16 PREVIOUS BOUNDARY NOTES (PNW)
[PREV_BOUNDARY.NOTES]

Record electronic PREVIOUS BOUNDARY NOTES, if needed, to clarify or explain a special situation in the boundary being defined.

When collected:	As needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

CHAPTER 8 TREE AND SAPLING DATA

This chapter describes how and where to tally live trees, standing dead trees (snags), and saplings. Determining which measurements are required is based on tree size, tree status, condition class status, and regional location, as well as land ownership. *Tree and sapling* data yield information on tree volume, growth, mortality, and removals; wildlife habitats; forest structure and composition; biomass; and carbon sequestration.

This chapter also describes how to record witness trees/stumps/objects. Witness information is recorded alongside the tree tally information (as witness trees and tally trees can be one in the same). Witness information assists the next field crew in relocating the center of a previously established plot/subplot.

SECTION 8.1 DEFINITIONS

Trees meeting specific criteria for diameter at breast height (DBH), or diameter at root collar (DRC), and length, are included in the sample. General definitions are listed below, followed by a table containing specific requirements.

Tree: An individual tree is categorized as a live tree, a standing dead tree (snag), or a sapling based on specific criteria listed in the table below. These criteria are different depending on whether the tree is a DBH or a DRC species. When the word "tree" is used in the field guide with no additional descriptors it applies to live trees, snags, and saplings. Applicable species are listed in Appendix D, FIA Tree Species Codes.

Live tree: Trees are alive if they have any living parts (leaves, buds, cambium) at or above the point of diameter measurement, either at DBH or at DRC depending on species. Trees that have been temporarily defoliated are still alive. Uprooted trees with signs of life above the point of diameter are considered alive as long as some roots are still in substrate. If all stems of a previously tallied woodland tree were killed, cut or removed and there are new sprouts at the base, treat the previously tallied tree as dead and the new sprouts (1.0-inch DRC and larger) as part of a new tree (Subsection 8.6.5, Diameter at Root Collar: Woodland stump sprouts). For DBH trees stump sprouts are considered new trees, saplings or seedlings if they originate between ground level and 4.5 feet after the creation of the "stump" (Subsection 8.6.4, Diameter at Breast Height: #2 Stump Sprouts).

Standing dead tree (snag): To qualify as a standing dead tally tree, dead trees must be at least 1.0 inch in diameter, have a bole which has an unbroken ACTUAL LENGTH of at least 4.5 feet *for DBH species and 1.0 feet for woodland species*, and lean less than 45 degrees from vertical as measured from the base of the tree to *the point of diameter measurement*. Dead standing tally trees, and partially separated boles of dead tally trees, do not have to be self-supported. They may be supported by other trees, branches, or their crown. Standing dead trees, recorded at the previous annual inventory, that shrink below minimum diameter and length requirements maintain dead tree status. Portions of boles on dead trees that are separated greater than 50 percent (either above or below *the point of diameter measurement*), are considered severed and may qualify as Down Woody Material (DWM), *if they otherwise meet DWM* criteria *(Chapter 11)*. For woodland species with multiple stems, a tree is considered down if more than 2/3 of the volume is no longer attached or upright.

Sapling: Trees ≥1.0 inch but <5.0 inches *DBH that meet a minimum length requirement are tallied on the microplot.* These criteria are different depending on whether the tree is a DBH or a DRC species.

Woodland species: Woodland species require a diameter measurement at the root collar (DRC) of ≥1.0 inch; individual stems must be at least 1.0 feet in length and 1.0 inch at 1.0 foot up the stem from the diameter measurement point. Examples include: honey mesquite; California juniper; and common pinyon. These species are listed in Appendix D, FIA Tree Species Codes. For multi-stemmed woodland species, a cumulative DRC is used to compute diameter as described in *Subsection 8.6.5*.

Tally trees: 'Tally trees' are defined as all live and standing dead trees in accessible forest land *or accessible, measurable nonforest land* condition classes encountered on the subplot*/macroplot* the first time a subplot*/macroplot* is established, and all trees that grow into a subplot*/macroplot* thereafter. 'Tally saplings' are defined as all live and standing dead saplings encountered the first time a microplot is established, and all saplings that grow into each microplot thereafter, *and* are included until they grow to 5.0 inches or larger, at which time they are tallied on the subplot and referenced (new AZIMUTH and HORIZONTAL DISTANCE taken) to the subplot center.

	Diameter	Length
Live tree (DBH species)	≥ 5.0 inches DBH	≥ 4.5 feet in length with living parts at or above DBH
Live tree (DRC species)	At least one stem ≥ 1.0 inches DRC and a cumulative DRC ≥ 5.0 inches*	≥1.0 feet in length with living parts at or above DRC*
Standing dead tree (DBH species)	≥1.0 inches DBH	≥ 4.5 feet in length (leaning less than 45 degrees from vertical)
Standing dead tree (DRC species)	At least one stem ≥1.0 inches DRC and a cumulative DRC ≥1.0 inches*	≥1.0 feet in length (leaning less than 45 degrees from vertical)*
Sapling (DBH species)	1.0 inch to 4.9 inches DBH	≥ 4.5 feet in length with living parts at or above DBH
Sapling (DRC species)	At least one stem ≥1.0 inches DRC and a cumulative DRC <5.0 inches*	≥1.0 feet in length with living parts at or above DRC*
*Single stems, and at least one stem contributing toward the cumulative DRC, must be ≥1.0 feet in length and ≥1.0 inches diameter at 1 foot up the stem from the point of diameter measurement.		

SECTION 8.2 SELECTING TALLY TREES

SUBSECTION 8.2.1 WHERE TO TALLY

Determining whether a tree qualifies as a "tally tree" depends upon a combination of the following:

- STATE
- OWNER CLASS
- ADMINISTRATIVE FOREST CODE
- CONDITION CLASS STATUS
- TREE SPECIES (must be listed on the Tree Species List found in Appendix D)
- DIAMETER (DBH/DRC) of the tree
- TREE STATUS
- TREE LENGTH
- HORIZONTAL DISTANCE from the fixed-radius plot center
- MACROPLOT BREAKPOINT DIAMETER

Trees on the subplot, microplot and annular plot are tallied according to the following rules. If a tree is located in an area that does not meet the criteria below, it is not a tally tree.

Table 8.1: Where to tally trees in California

CALIFORNIA [STATE = 06]				
CONDITION CLASS OWNERSHIP TYPE			**Lands not administered by the Forest Service and R4 Forest Service administered lands** [ADMINISTRATIVE FOREST CODE = null or 417]	**R5 or R6 Forest Service administered lands** [ADMINISTRATIVE FOREST CODE = 501 - 599 or 610 or 611]
TREES ARE TALLIED IN			Accessible forest land condition classes [CONDITION CLASS STATUS = 1]	Accessible forest land and nonforest land condition classes [CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS =2]
MICROPLOT (6.8-foot radius)			All live and dead saplings (1.0 inches to 4.9 inches DBH/DRC) on the microplot are tallied and referenced to the microplot center	
SUBPLOT (24.0-foot radius)			All live trees and snags ≥5.0 inches DBH/DRC on the subplot are tallied and referenced to the subplot center	
ANNULAR AREA/ MACROPLOT (24.0 to 58.9-foot radius from subplot center)	MACROPLOT BREAKPOINT DIAMETER	24 INCHES	All live trees and snags ≥24.0 inches DBH/DRC on the annular plot are tallied and referenced to the subplot center	

Table 8.2: Where to tally trees in Oregon and Washington

OREGON [STATE = 41] and **WASHINGTON** [STATE = 53]				
CONDITION CLASS OWNERSHIP TYPE			**Lands not administered by the Forest Service and R1 Forest Service administered lands** [ADMINISTRATIVE FOREST CODE = null or 104]	**R6 Forest Service administered lands** [ADMINISTRATIVE FOREST CODE = 601 - 699] **Western Oregon BLM timberlands study area** [OWNER CLASS = 22 and BLM RESOURCE AREA = not null]
TREES ARE TALLIED IN			Accessible forest land condition classes [CONDITION CLASS STATUS = 1]	Accessible forest land and nonforest land condition classes [CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS =2]
MICROPLOT (6.8-foot radius)			All live and dead saplings (1.0 inches to 4.9 inches DBH/DRC) on the microplot are tallied and referenced to the microplot center	
SUBPLOT (24.0-foot radius)			All live trees and snags ≥5.0 inches DBH/DRC on the subplot are tallied and referenced to the subplot center	
ANNULAR AREA/ MACROPLOT (24.0 to 58.9-foot radius from subplot center)	MACROPLOT BREAKPOINT DIAMETER See Appendix B for east/west designation for by county	24 INCHES: Eastern OR & WA	All live trees and snags ≥24.0 inches DBH/DRC on the annular plot are tallied and referenced to the subplot center	
		30 INCHES: Western OR & WA	All live trees and snags ≥30.0 inches DBH/DRC on the annular plot are tallied and referenced to the subplot center	

SUBSECTION 8.2.2 WITHIN PLOT AREA CRITERIA

Trees and saplings are selected for tally (measurement) only when the HORIZONTAL DISTANCE from the microplot/subplot center to the bole center at the ground is less than or equal to the radius of that microplot/subplot/macroplot. Trees must be selected for tally within the appropriate fixed-radius area without error. The tolerances for HORIZONTAL DISTANCE to trees (Item 8.5.1.14) do not apply when determining whether a tree is tallied within the specified plot area.

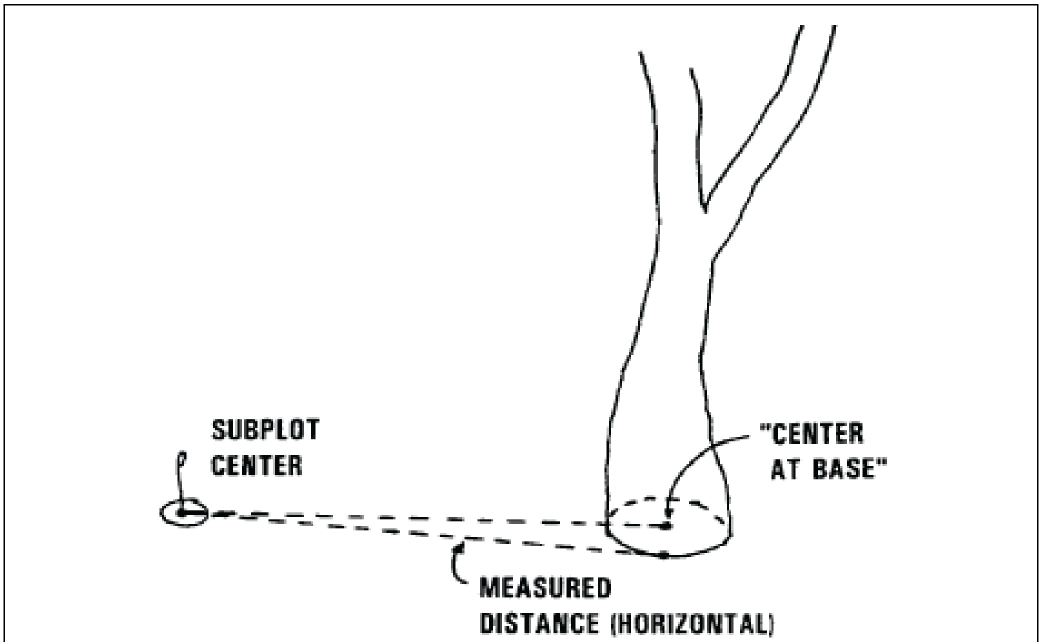


Figure 8.1: Horizontal distance from plot center criteria for determining tally trees.

SECTION 8.3 GROWTH SAMPLE TREES

On remeasurement plots (SAMPLE KIND = 2) in California, Oregon, and Washington, tree lengths will be measured on a subset of trees to improve field efficiency. Lengths of normally-formed trees (TOTAL LENGTH) can be estimated well with regression models when an appropriate subsample of trees are measured on a plot. The live trees for which TOTAL LENGTH and ACTUAL LENGTH must be measured will be identified systematically on the plot, by condition, species, and diameter class, and are called GROWTH SAMPLE TREEs (GSTs). In addition to intact live trees, all live trees with observed broken tops, and all standing dead trees, will be coded as GSTs (because their growth, or decay, cannot be modeled) and have TOTAL LENGTH and ACTUAL LENGTH measured or estimated in the field. In addition, rare tree species found on less than 30 plots will always be measured for TOTAL LENGTH and ACTUAL LENGTH (Table 8.6). For GST trees, all crown and status variables must be measured. For non-GST trees, some variables (COMPACTED CROWN RATIO, CROWN CLASS, DWARF MISTLETOE CLASS, ROTTEN/MISSING CULL, ROUGH CULL, REMNANT TREE, FORM CLASS) will be downloaded from the previous measurement and can be used for the current measurement if conditions have not changed dramatically (see guidance for these items) or updated if necessary.

Growth Sample Trees (GST): Live trees on remeasured plots (SAMPLE KIND = 2) are selected by species and diameter class to be measured for tree height (length) and will have GROWTH SAMPLE TREE (Item 8.7.2.1) = Y. In addition, all standing dead trees and broken-topped trees also need to be measured for height and will have GROWTH SAMPLE TREE = Y. All other live trees with unbroken tops will have heights modeled based on the measured GST trees.

SECTION 8.4 CONDUCTING THE TREE TALLY

<u>Begin tallying trees at an azimuth of 001 degrees from subplot center and continue clockwise around the *macroplot. Work outward from subplot center to macroplot perimeter.* Repeat this sequence for trees on the microplot.</u> Select, record, and tag subplot witness trees/stumps/objects while recording tree tracking data on the macroplot.

SUBSECTION 8.4.1 SUBPLOT WITNESS TREES/OBJECTS

Each of the four subplot center stakes or metal pins should be referenced by a minimum of two subplot witness trees/objects. Use the following procedures to select and record witnesses. Refer to Table 3.2: Standards for monumentation of various witness types, for specific monumentation guidelines.

A. **Selecting witnesses:** Select two trees/objects near the subplot center which form, as closely as possible, a right angle with the center marker. Trees within six feet of the subplot center are preferable. If live trees are not available, use sound snags, stumps, or objects. On subplots established previously, reuse the previous witness trees, unless better trees are available.
B. **Monumenting witnesses:** Monumentation procedures vary depending on the subplot being witnessed; plot center (PC, center of subplot 1) has different monumentation than subplots 2 through 4. Refer to Table 3.2: Standards for monumentation of various witness types, for specific monumentation guidelines.
C. **Recording witness data (all subplots on the standard layout):** Identify witness trees/snags/stumps/objects in the data recorder (PDR) using the procedures listed below:
   - **Tally tree/snag (a trackable tree record):** Record SUBPLOT TALLY TREE WITNESS FLAG = Y (Item 8.5.1.9) to mark tally trees/snags as witnesses.
   - **Non-tally tree/snag:** Enter a new record for the tree/snag; record PRESENT TREE STATUS = 8, witness non-tally tree (Item 8.5.1.8).
   - **Stump**: Enter a new record for the stump; record PRESENT TREE STATUS = 7, witness stump (Item 8.5.1.8). Note: When recording stumps as witnesses, use the guidelines listed in Subsection 8.6.3 (Diameter on Stumps) to measure diameter.
   - **Shrub or object:** Enter a new record for the shrub or object; record PRESENT TREE STATUS = 9, witness-only object (Item 8.5.1.8). Note: Record the shrub species name in TREE NOTES (Item 8.10.1.1).

   In addition, record the following information for each witness:

   - SPECIES - If applicable (Item 8.5.1.12)
   - AZIMUTH - Subplot center to tree (Item 8.5.1.13)
   - SLOPE DISTANCE TO WITNESS TREE OR OBJECT - From the subplot stake/pin where it enters the ground to the head of the top nail affixing the basal tag or tree number tag (Item 8.5.1.2)
   - DIAMETER (Item 8.6.4.2 or Item 8.6.5.2)

   Note: For witnesses, distance is always recorded as a slope distance from the subplot center to the tag at the base of the tree, rather than as a horizontal distance to the center of the tree collected for tally trees.

SUBSECTION 8.4.2 SUBPLOTS/CONDITIONS WITHOUT TALLY TREES

This subsection provides information about recording tree data on subplots with special circumstances.

- If all accessible forest condition classes within subplot 1 have no tally trees present, two records are required to **witness subplot center**. These witness records can represent sound stumps or snags, but live trees are preferable.
- If the plot is entirely nonforest and it was ground visited, record two witness records for subplot 1.
- If the plot is entirely nonforest and it is Region 5 or Region 6 Forest Service administered lands, record two witness records for each subplot.

SECTION 8.5 TREE TRACKING

SUBSECTION 8.5.1 TREE TRACKING DATA ITEMS

Item 8.5.1.1 SUBPLOT NUMBER (CORE 5.1)
[TREE.SUBP]

A 1-digit code, generated for each tree record entered into the PDR, regardless of the status of the tree record (live tree, snag, witness-only tree, etc.).

When Collected:	All tree records	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 8.5.1.2 TREE RECORD NUMBER (CORE 5.2)
[TREE.TREE]

A 3-digit code, *assigned by the PDR*, to uniquely and permanently identify each tree on a given subplot. At the time of remeasurement (SAMPLE KIND = 2), TREE RECORD NUMBERs will be downloaded for previously recorded trees, snags, and witness-only records. TREE RECORD NUMBERS cannot be changed by the field crew.

When Collected:	All tree records
Field width:	3 digits
Tolerance:	No errors
Values:	001 to 999

Item 8.5.1.3 TREE TAG NUMBER (PNW)
[TREE.TAG_NO_PNWRS]

Affix an aluminum tree number tag and record a TREE TAG NUMBER for all tally trees ≥1.0 inch DBH/DRC (**except** witness-only trees) sampled at the current inventory; this includes trees recorded, but not tagged, during a previous visit (e.g., saplings and snags). Number trees in a clockwise order from AZIMUTH 001 to 360, and work outwards from subplot center to macroplot perimeter. Repeat this sequence for saplings on the microplot. Attempt to keep tree numbers in order. However, **do not** renumber all trees on a microplot/ subplot/macroplot in order to assign a more “correct” tree number to a missed tree.

Saplings <3.0 inches DBH/DRC: Wire the tag to an ancillary branch.

Saplings ≥3.0 inches DBH/DRC: Nail the tag below stump height and facing microplot center.

Trees ≥5.0 inches DBH/DRC: Nail the tag below stump height and facing subplot center.

Live trees: Drive the nail in only as far as is necessary to firmly anchor it in the wood. If a tree which requires a TREE TAG NUMBER has a PNW-FIA tag from a previous inventory, reuse the old tag, if serviceable, or attach a new tag. If an old PNW-FIA tag must be replaced, discard it. If an old tag cannot be removed, pound it in until flush with the bark so it will be overgrown and will not be confused with the new tag.

Standing dead trees: Pound the nail flush with the bole on all standing dead trees; including previously live trees, which are now dead.

Do not use a TREE TAG NUMBER more than once on a plot. Before leaving the vehicle, make sure the tree numbers previously assigned to downloaded trees are different than numbers on the new tags you may use.

- **On Region 6 (R6) Forest Service administered lands** use long nails and blue number tags at the current visit to differentiate them from the old CVS tags. Do not remove previous R6 CVS tree number tags.
- **On Region 5 (R5) Forest Service administered lands** use standard number tags at the current visit. Do not remove previous R5 inventory tree number tags.

Follow any special monumenting protocols specified for wilderness or national park plots (see Section 3.6 and Section 3.7).

When collected:	When PRESENT TREE STATUS = 1; **or** when PRESENT TREE STATUS = 2 and STANDING DEAD = 1
Field width:	3 digits
Tolerance:	No errors
Values:	001 to 999

Item 8.5.1.4 PREVIOUS TREE TAG NUMBER (PACI, PFSL)
[TREE.PREV_TAG_NO_PNWRS]

If any tree tallied at the current inventory has a tree number tag from a previous R6 CVS plot, R5 inventory plot, or PNW-FIA plot, record the tag number. This item is recorded for live trees, dead trees, and saplings, and will help link current data to previously collected data.

If more than one old tree number tag is present, record the one from the most recent inventory.

If more than one old tree number tag is present and **a tag is reused**:

- On periodic revisited plots (PNW PLOT KIND = 2 or 3): Record the most recent periodic number for TREE TAG NUMBER and also for PREVIOUS TREE TAG NUMBER.
- On remeasurement plots (SAMPLE KIND = 2): Record the TREE TAG NUMBER from the previous annual visit for the “current” TREE TAG NUMBER and also for PREVIOUS TREE TAG NUMBER.

When collected:	When SAMPLE KIND = 2: all live and dead tally trees with a previous Region 6 CVS, Region 5, or PNW-FIA number tag on the tree
Field width:	3 digits
Tolerance:	No errors
Values:	001 to 999

Item 8.5.1.5 CONDITION CLASS NUMBER (CORE 5.3)
[TREE.CONDID]

Record the CONDITION CLASS NUMBER in which each tree is located. Often, a referenced boundary is approximate, and trees selected for tally are assigned to the actual condition in which they lie regardless of the recorded approximate boundary (Figure 8.2). Trees must be assigned to a condition present on the subplot/macroplot condition list.

On remeasurement plots (SAMPLE KIND = 2), the previous CONDITION CLASS NUMBER is downloaded and displayed on the PDR for each remeasurement tree. If necessary, change the CONDITION CLASS NUMBER to reflect current condition classes and boundaries.

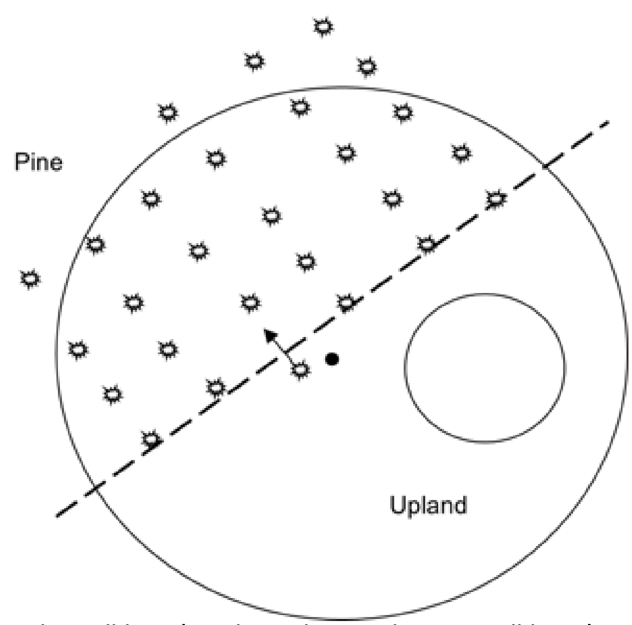


Figure 8.2: Ragged condition class boundary and tree condition class designation

When Collected:	All *tally* trees
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 8.5.1.6 PREVIOUS CONDITION CLASS NUMBER (PNW)
[TREE.PREVCOND]

A downloaded value that may be updated if an error was made by the previous crew. Only edit and change PREVIOUS CONDITION CLASS NUMBER if the previous crew made a mistake. The data recorder will automatically update the PREVIOUS CONDITION CLASS NUMBER if none of the previous boundaries have changed. If any of the previous boundaries have been changed, the current crew is required to assign the previously tallied trees to a corrected PREVIOUS CONDITION CLASS NUMBER.

When Collected:	SAMPLE KIND = 2
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 8.5.1.7 PREVIOUS TREE STATUS (CORE 5.6)
[TREE.PREV_STATUS_CD]

A downloaded code for all trees tallied at the previous inventory, including ALL new standing dead trees (PRESENT TREE STATUS = 2, STANDING DEAD CODE = 1, RECONCILE >0). This code is used to track the status of sample trees over time.

When Collected:	On remeasurement plots (SAMPLE KIND = 2), all previously tallied trees ≥1.0 in*ch* DBH*/DRC and witness objects*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Live Tree – alive at the previous inventory
	2	Dead Tree – standing dead tree at the previous inventory
	7	Witness Stump - A subplot witness that is a stump.
	8	Witness Non-Tally Tree – A non-tally live or dead tree that is used for a subplot witness.
	9	Witness-Only – A subplot witness that is not a tree. It may be a shrub, rock or other.

Item 8.5.1.8 PRESENT TREE STATUS (CORE 5.7)
[TREE.STATUSCD_PNWRS; Trees with regional status codes 7, 8, or 9 will be loaded into the NON_TALLY_TREE_PNWRS table]

Record a PRESENT TREE STATUS for each tallied tree. This code is used to track the status of sample trees over time: as they first appear, as ingrowth, as they survive, and when they die or are removed.

Witness-only trees/stumps/objects are also assigned a PRESENT TREE STATUS. When a tree has been killed by fire, drought, beetles, etc., then salvage logged and no longer on site, PRESENT TREE STATUS should be 3.

When collected:	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC *and witness non-tally trees, witness stumps, and witness-only objects.*		
Field width:	1 digit		
Tolerance:	No errors		
Values:	Code	Tree Status	Description
	0	No Status	*Remeasurement plots only.* Tree is not presently in the sample. Tree was incorrectly tallied at the previous inventory or currently is not tallied due to definition or procedural change, or is not tallied because it is located on a nonsampled condition (i.e., hazardous or denied)*, or due to natural causes (e.g., moved beyond the radius of the plot by small earth movement, hurricane, etc)*. Requires RECONCILE code = 5-9.
	1	Live Tree	Any live tree (new, remeasured or ingrowth)

	2	Dead Tree	Any dead tree (new, remeasured or ingrowth) regardless of cause of death. Includes all previously standing dead trees that no longer qualify as standing dead, trees killed by silvicultural or land clearing activity and assumed not to have been utilized, as well as dead trees that may have been present at the time of plot establishment but only tallied now due to procedural change. *Includes: previously dead standing, now down, and previously dead standing that no longer meet diameter and length requirements.*
	3	Removed	*Remeasurement plots only.* A tree that has been cut or removed by direct human activity related to harvesting, silvicultural activity or land clearing. The tree is assumed to have been utilized.
	7	Witness Stump	A subplot witness that is a **stump***
	8	Witness Non-Tally Tree	A **non-tally** live or dead tree that is to be used for a subplot witness
	9	Witness-Only Object	A subplot **witness that is not a tree**. It may be a shrub, rock, or other; TREE NOTES are required to describe the witness.
*Refer to Subsection 8.6.3, Diameter on Stumps, for stump diameter measurement guidelines.			

Item 8.5.1.9 SUBPLOT TALLY TREE WITNESS (PNW)
[TREE.SUBP_WITNESS_FLAG_PNWRS]

Use this data item to mark the current tally tree (live or dead) as a witness. See Subsection 3.3.2, Witness Trees/Objects, for witness monumentation instructions. Note: The default for this item is “N”; update the field to “Y” to record a witness.

When collected:	When PRESENT TREE STATUS = 1, 7, 8, or 9; **or** when PRESENT TREE STATUS = 2 and STANDING DEAD = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	N	current record is not a tally tree witness
	Y	current record is a tally tree witness

Item 8.5.1.10 STANDING DEAD (CORE 5.7.2)
[TREE.STANDING_DEAD_CD]

Record the code that describes whether or not a tree qualifies as standing dead. *Standing* dead trees must be at least 1.0 inch in diameter *(DBH or DRC)*, have a bole that has an unbroken ACTUAL LENGTH of at least 4.5 feet *(DBH species) or 1.0 feet (DRC species with single stems)*, and lean less than 45 degrees from vertical as measured from the base of the tree to *the point of diameter measurement*. See Figure 8.3 through Figure 8.5. Trees that do not meet the standing dead definition are considered down dead regardless of the diameter of any remaining shards at the diameter measurement point.

Unbroken is demonstrated by ≥ 50 percent of the bole's circumference (shell) being continuously intact. Intact is defined as not severed, splintered, shattered, fractured or missing (due to fracturing) and still attached to the original source of growth. To determine the percentage broken compare the current intact portion of the shell to a projection of the portion of the shell that is no longer intact (Figure 8.6 & Figure 8.7). If a bole has split into multiple sections at least one of the sections must represent at least 50 percent of the bole's circumference to be considered unbroken (Figure 8.8). Boles that have shrunk for any reason but are still intact are considered unbroken (Figure 8.9). Additionally, the emphasis is on an "unbroken" bole rather than any rotten or missing wood that would be captured in the ROTTEN/MISSING CULL variable. At times differentiating wood that is missing due to fracturing (counts towards a broken bole) from wood that is missing due to rot, fire or other (does not count towards a broken bole) is difficult; if uncertainty exists assume the missing wood is due to fracturing. *For old, decaying snags, such as those found in Pacific Northwest, use regional guidelines to help determine whether a tree is missing wood due to fracturing or rot.*

Trees that do not meet the standing dead definition are considered down dead regardless of the diameter of any remaining shards at the diameter measurement point.

Portions of boles on dead trees that are separated greater than 50 percent (either above or below 4.5 feet), are considered severed and are included in Down Woody Material (DWM) if they otherwise meet DWM tally criteria.

For woodland species (Appendix D, FIA Tree Species Codes) with multiple stems, a tree is considered down if more than 2/3 of the volume is no longer attached or upright; do not consider cut and removed volume.

Live and dead standing tally trees, and partially separated boles of dead tally trees, do not have to be self-supported. They may be supported by other trees, branches, or their crown.

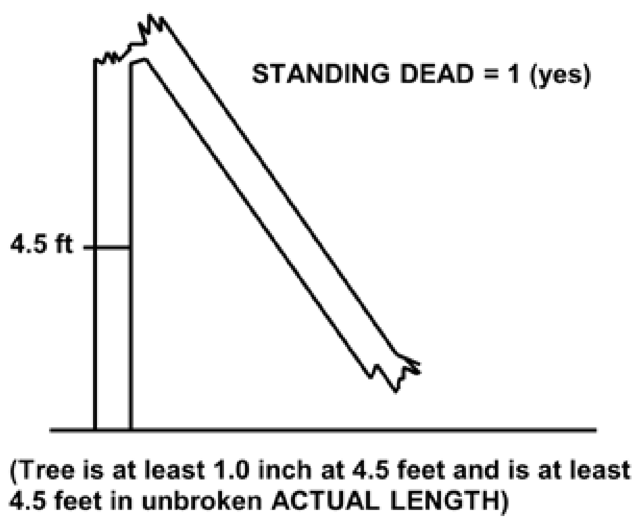


Figure 8.3: Example of an unbroken bole to 4.5 feet

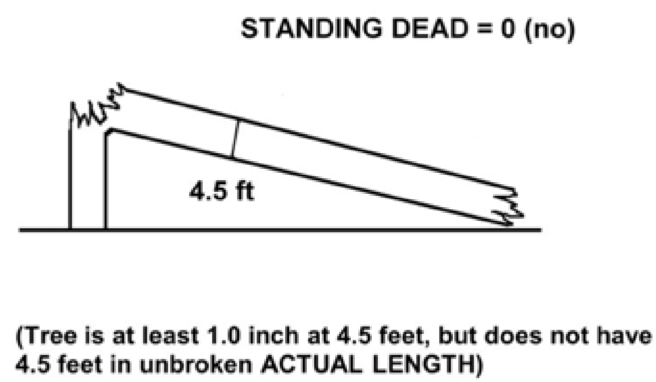


Figure 8.4: Example of an unbroken length of <4.5 feet

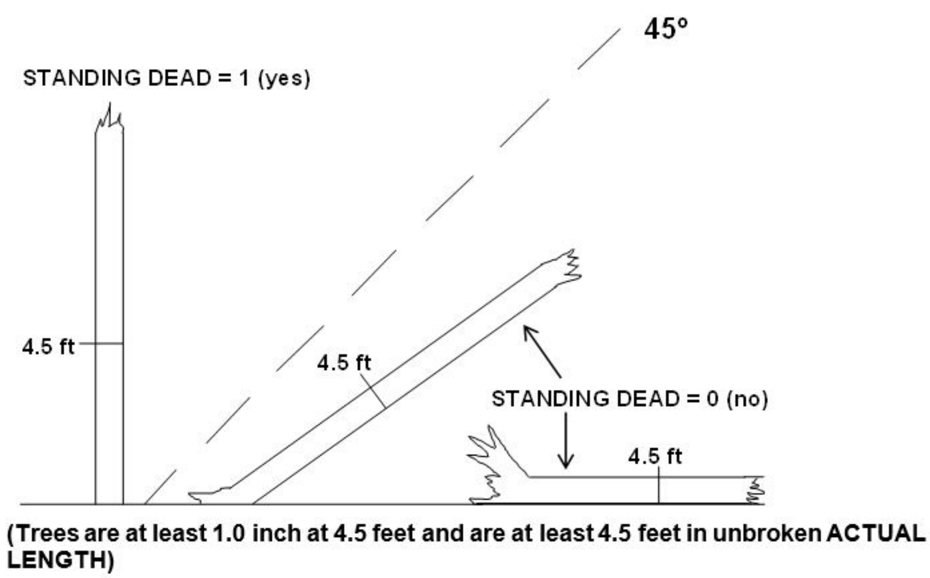


Figure 8.5: Other examples of dead trees

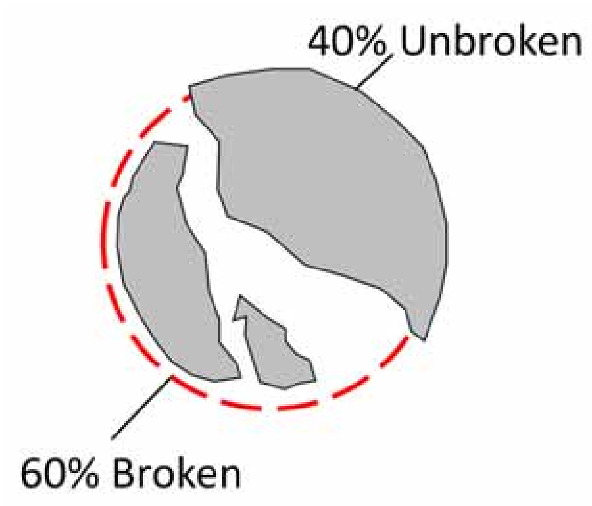


Figure 8.6: 40% unbroken.

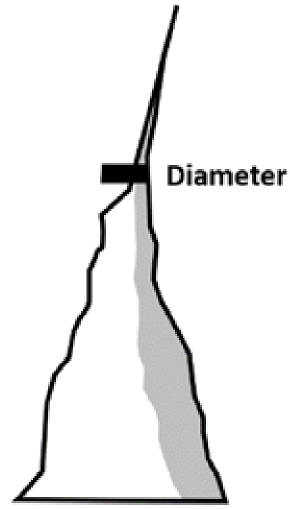


Figure 8.7: 10% unbroken.

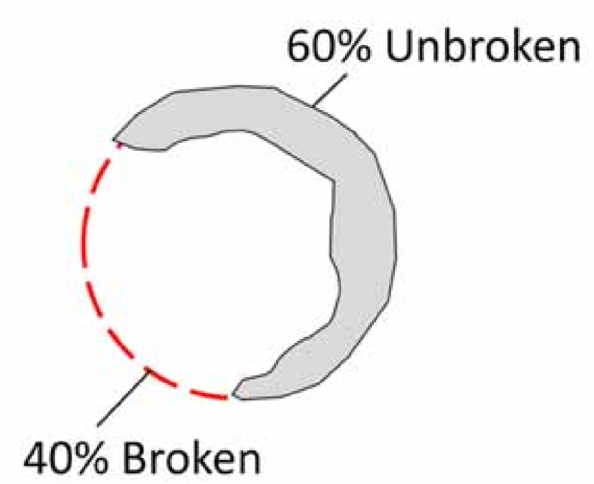


Figure 8.8: 60% unbroken.

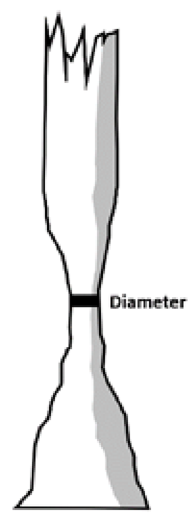


Figure 8.9: 100% unbroken.

When Collected:	All dead tally trees (PRESENT TREE STATUS = 2)	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	No – tree does not qualify as standing dead
	1	Yes – tree does qualify as standing dead

Item 8.5.1.11 RECONCILE (CORE 5.7.1)
[TREE.RECONCILECD]

For remeasurement locations only *(SAMPLE KIND = 2)*, record a RECONCILE code for any new tally tree that was not tallied in the previous inventory, and for all no status remeasurement trees (PRESENT TREE STATUS = 0). This code is used to identify the reason a new tree appeared in the inventory, and identify the reason a remeasurement tree no longer qualifies as a tally tree.

Code 5 is used to indicate live trees that shrink below the diameter threshold on the microplot/subplot/macroplot. For example, if a live remeasurement tree shrinks below the 5.0 inch DBH/DRC, then record the following combination of codes: PREVIOUS TREE STATUS = 1, PRESENT TREE STATUS = 0, RECONCILE = 5. If a live measured tree shrinks below the 5.0 inch threshold on the subplot and is currently greater than or equal to 1.0 inch on the microplot, then record PREVIOUS TREE STATUS = 1, PRESENT TREE STATUS = 1. Record all required items for a tally sapling. Use the TREE CODING GUIDE in Appendix F to determine the national coding method for remeasurement trees.

<table>
<tr><td>When collected:</td><td colspan="3">When SAMPLE KIND = 2: all new live and standing dead tally trees and saplings ≥1.0 inch DBH/DRC (PRESENT TREE STATUS = 1 or 2 and no PREVIOUS TREE STATUS); and all no status trees (PRESENT TREE STATUS = 0).</td></tr>
<tr><td>Field width:</td><td colspan="3">2 digit</td></tr>
<tr><td>Tolerance:</td><td colspan="3">No errors</td></tr>
<tr><td>Values:</td><td>Code</td><td colspan="2">Definition</td></tr>
<tr><td colspan="4">Codes 1-2 are only valid for new trees (PRESENT TREE STATUS = 1 or 2) on the plot and exclude trees associated with a change in procedures / definitions or previous cruiser error, as such trees are accounted for with RECONCILE = 7 or 8. If a new tree is located in an area that was previously nonsampled, then use RECONCILE = 9.</td></tr>
<tr><td></td><td>1</td><td>Ingrowth</td><td>Either (a) a new tally tree not qualifying as through growth, or (b) a new tree on land that was formerly nonforest and now qualifies as forest land unrelated to cruiser error or procedural / definition change.</td></tr>
<tr><td></td><td>2</td><td>Through growth</td><td>New tally tree 5.0 inches DBH/DRC and larger, within the microplot, which was not missed at the previous inventory (i.e., grew from seedling to at least 5.0 inches DBH between plot inventory cycles - such trees were never tallied on a microplot).</td></tr>
<tr><td colspan="4">Code 5 is only valid for remeasured trees (PRESENT TREE STATUS = 0) that no longer qualify as tally.</td></tr>
<tr><td></td><td>5</td><td>Shrank</td><td>Live tree that shrank below threshold diameter on microplot / subplot / macroplot. Must currently be alive.</td></tr>
<tr><td colspan="4">Codes 6-9 are valid for both new tally trees (PRESENT TREE STATUS = 1 or 2) and remeasured trees that no longer qualify as tally (PRESENT TREE STATUS = 0).</td></tr>
<tr><td></td><td>6</td><td>Physical movement</td><td>Either (a) tree was correctly tallied in previous inventory, but has now moved beyond the radius of the plot due to natural causes (e.g., small earth movement, hurricane), or (b) tree was outside the radius of the plot previously, but has now moved within the plot due to natural causes. Tree must be either live before and still alive now, or dead before and dead now. If tree was live before and now dead, this is a mortality tree and should have PRESENT TREE STATUS = 2 (not 0).</td></tr>
<tr><td></td><td>7</td><td>Cruiser error</td><td>Either (a) tree was erroneously tallied (added tree), or (b) tree was erroneously not tallied (missed tree) at the previous inventory.</td></tr>
<tr><td></td><td>8</td><td>Procedural change</td><td>Either (a) tree was tallied at the previous inventory, but is no longer tallied due to a definition or procedural change, or (b) was not tallied at the previous inventory, but is now tallied due to a definition or procedural change, regardless of DBH/DRC at the time of the previous inventory.</td></tr>
<tr><td></td><td>9</td><td>Nonsampled area</td><td>Either (a) tree was located in a sampled condition at the previous inventory, but now is in a nonsampled condition, or (b) the area where the tree is located was previously not sampled, but now is sampled. All trees located in a nonsampled area (either now or previously) have RECONCILE = 9.</td></tr>
</table>

The following table, which is an abbreviated list from Appendix F, describes how to tally standing dead saplings with respective PRESENT TREE STATUS, RECONCILE CODE, and STANDING DEAD, which were being collected for the first time in Field Guide version 7.0:

Dead Sapling Tally – New plots	PRESENT TREE STATUS	RECONCILE CODE	STANDING DEAD	CAUSE of DEATH
Standing dead 1.0 – 4.9 DBH/DRC	2	Null	Auto-populated	Core optional

Dead Sapling Tally – Remeasure plots	PRESENT TREE STATUS	RECONCILE CODE	STANDING DEAD	CAUSE of DEATH
YEAR OF PREVIOUS INVENTORY ≥ 2016 - Previous ≥ 1 inch and <5 inches and was dead and is still standing dead	2	7	1	null
YEAR OF PREVIOUS INVENTORY ≥ 2016 - Previous live 1+ missed; now 1+ DBH/ DRC and dead	2	7	1	10-80
Previous live <1.0 and has grown to ≥1.0 and died	2	1	1	10-80
Previous live 1.0+; now standing dead 5.0+ DBH/DRC	2	Null	1	10-80
YEAR OF PREVIOUS INVENTORY < 2016 - Previous ≥ 1 inch and <5 inches and was dead and is still standing dead	2	8	1	Null
YEAR OF PREVIOUS INVENTORY < 2016 - Previous live 1+ missed; now 1+ DBH/DRC and dead	2	8	1	10-80
Previous live 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot).	2	Null	0	10-80
Previous dead 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot).	2	Null	0	Null
Previous live 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead located on the microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center.	2	Null	1	10-80
Previous dead 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead located on the microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center.	2	Null	1	Null

Item 8.5.1.12 SPECIES (CORE 5.8)
[TREE.SPCD; TREE.PREV_SPCD_PNWRS]

Record the appropriate SPECIES code from the Master Species List (Appendix D). If the species cannot be determined in the field, tally the tree, but bring branch samples, foliage, cones, flowers, bark, etc. to the office for further researching. If possible, collect samples outside the subplots from similar specimens and make a note to correct the SPECIES code later. If a hybrid species is found, naturally or planted, and is on the Master Species List, use the hybrid code; otherwise code the parent species with the most dominant characteristic from the list. If neither the hybrid nor either of the parent species are listed, then do not tally the species and follow the UNLISTED TREE protocol (Item 6.1.2.1 - Item 6.1.2.5). If a variety or subspecies is found, naturally or planted, and is listed on the Master Species List, use the corresponding variety / subspecies code. If the variety is not listed, but the species is listed, code the specimen using the species code. Species marked as woodland (W) designate species where DRC is measured instead of DBH. Code “999” is **not a valid species code** for PFSL.

On remeasurement plots (SAMPLE KIND = 2), previous SPECIES information will be downloaded and displayed in the current SPECIES field in the PDR for each remeasurement tree. Correct the SPECIES code if the SPECIES was incorrectly identified, or SPECIES = 999 at the last inventory, even if the tree is no longer a valid tally tree (PRESENT TREE STATUS = 0).

The Master Species List includes all tree species tallied in the continental U.S as well as both the Caribbean and Pacific Islands, including Hawaii (Figure 8.10).

- It includes an Islands Sub-list which also contains one P2/3 Sub-list which allows for species to be excluded from tally on P2/3 plot types. As of Field Guide 9.2, there are no species on the Islands P2/3 Sub-list.
- It also includes a Mainland Sub-list which also contains nine P2/3 Sub-lists based on National Forest System regional boundaries which allows for species to be excluded from tally on P2/3 plot types. Plots are assigned to specific National Forest System regional boundaries in the office as these boundaries do not always follow State boundaries. For example, NFS R1 goes into WA, NFS R6 goes into ID, NFS R4 goes into CA, and NFS R8 goes into WV (Figure 8.11).
- 33 species (FG 9.2) separate the Islands Sub-list from the Mainland Sub-list as shown in Table 8.4, tally of these species is limited to the Islands (Pacific and Caribbean). These species are referred to as Island Only Species (IOS).
- Species listed on a specific P2/3 Sub-list are considered shrubs within the specific area associated with the P2/3 Sub-list on both P2 and P3 plots including DWM.

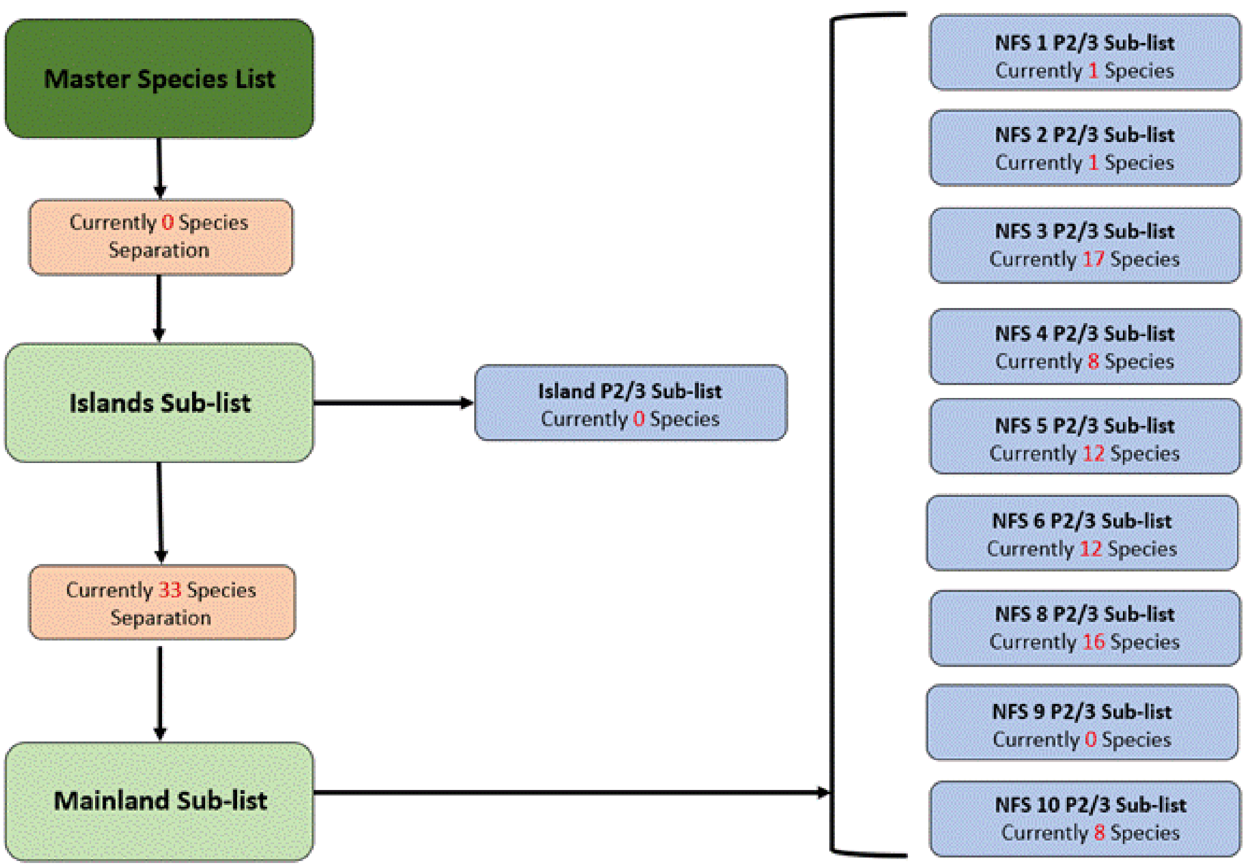


Figure 8.10: Description of the Master Species List.

Table 8.4:List of species separating the Island and Mainland Sub-lists; these species are referred to as Island Only Species (IOS)

Islands Only Species	Wood-land	FIA code	Common name	Genus	Species	Variety	PLANTS code	Past NRS tally	Past PNW tally	Past RMRS tally	Past SRS tally	Carib-bean	Pacific	Urban	Historic P2
IOS	.	300	acacia spp.	Acacia	spp.	.	ACACI	R, U	P, U	U	C, U	C	P	.	P2
IOS	.	999	other or unknown live tree	Tree	unknown	.	2TREE	R, U	R, U	R, U	R, C, U	C	.	.	P2
IOS	.	6161	shoebutton	Ardisia	elliptica	.	AREL4	U	P, U	U	U	.	P	.	.
IOS	.	6474	day jessamine	Cestrum	diurnum	.	CEDI6	U	P, U	U	C, U	C	P	.	.
IOS	.	6535	icaco coco plum	Chrysobalanus	icaco	.	CHIC	U	U	U	C, U	C	.	.	.
IOS	.	6670	seagrape	Coccoloba	uvifera	.	COUV	U	P, U	U	C, U	C	P	.	.
IOS	.	6862	swamp titi	Cyrilla	racemiflora	.	CYRA	U	U	U	C, U	C	.	.	.
IOS	.	7104	Surinam cherry	Eugenia	uniflora	.	EUUN2	U	P, U	U	C, U	C	P	.	.
IOS	.	7196	Florida swampprivet	Forestiera	segregata	.	FOSE	U	U	U	C, U	C	.	.	.
IOS	.	7264	upland cotton	Gossypium	hirsutum	.	GOHIH2	U	P, U	U	C, U	C	P	.	.
IOS	.	7330	scarletbush	Hamelia	patens	.	HAPA3	U	U	U	C, U	C	.	.	.
IOS	.	7408	Dixie rosemallow	Hibiscus	mutabilis	.	HIMU3	U	P, U	U	U	.	P	.	.
IOS	.	7410	shoeblackplant	Hibiscus	rosa-sinensis	.	HIRO3	U	U	U	C, U	C	.	.	.
IOS	.	7455	dahoon	Ilex	cassine	.	ILCA	U	U	U	C, U	C	.	.	.
IOS	.	7493	coralbush	Jatropha	multifida	.	JAMU	U	U	U	C, U	C	.	.	.
IOS	.	7768	teabush	Melochia	tomentosa	.	METO4	U	U	U	C, U	C	.	.	.
IOS	.	7845	Wax Myrtle	Morella	cerifera	.	MOCE2	U	P, U	U	C, U	C	P	.	.
IOS	.	7912	Myrsine cubana	Myrsine	cubana	.	MYCU2	U	U	U	C, U	C	.	.	.
IOS	.	8425	white indigoberry	Randia	aculeata	.	RAAC	U	U	U	C, U	C	.	.	.
IOS	.	8472	castorbean	Ricinus	communis	.	RICO3	U	P, U	U	C, U	C	P	.	.
IOS	.	8563	Brazilian peppertree	Schinus	terebinthifolius	.	SCTE	U	P, U	U	C, U	C	P	.	.
IOS	.	8589	flor de San Jose	Senna	atomaria	.	SEAT3	U	U	U	C, U	C	.	.	.
IOS	.	8592	valamuerto	Senna	pendula	.	SEPE4	U	P, U	U	U	.	P	.	.
IOS	.	8628	American black nightshade	Solanum	americanum	.	SOAM	U	P, U	U	U	.	P	.	.
IOS	.	8626	Solanum bahamense	Solanum	bahamense	.	SOBAB	U	U	U	C, U	C	.	.	.
IOS	.	8627	mullein nightshade	Solanum	donianum	.	SODO3	U	U	U	C, U	C	.	.	.
IOS	.	8629	potatotree	Solanum	erianthum	.	SOER2	U	U	U	C, U	C	.	.	.
IOS	.	8643	silver bush	Sophora	tomentosa	.	SOTO3	U	P, U	U	U	.	P	.	.
IOS	.	8676	bay cedar	Suriana	maritima	.	SUMA2	U	P, U	U	C, U	C	P	.	.
IOS	.	8876	simpleleaf chastetree	Vitex	trifolia	.	VITR7	U	P, U	U	U	.	P	.	.
IOS	.	8901	tallow wood	Ximenia	americana	.	XIAM	U	P, U	U	C, U	C	P	.	.
IOS	.	8916	aloe yucca	Yucca	aloifolia	.	YUAL	U	U	U	C, U	C	.	.	.
IOS	.	8918	moundlily yucca	Yucca	gloriosa	.	YUGL2	U	U	U	C, U	C	.	.	.

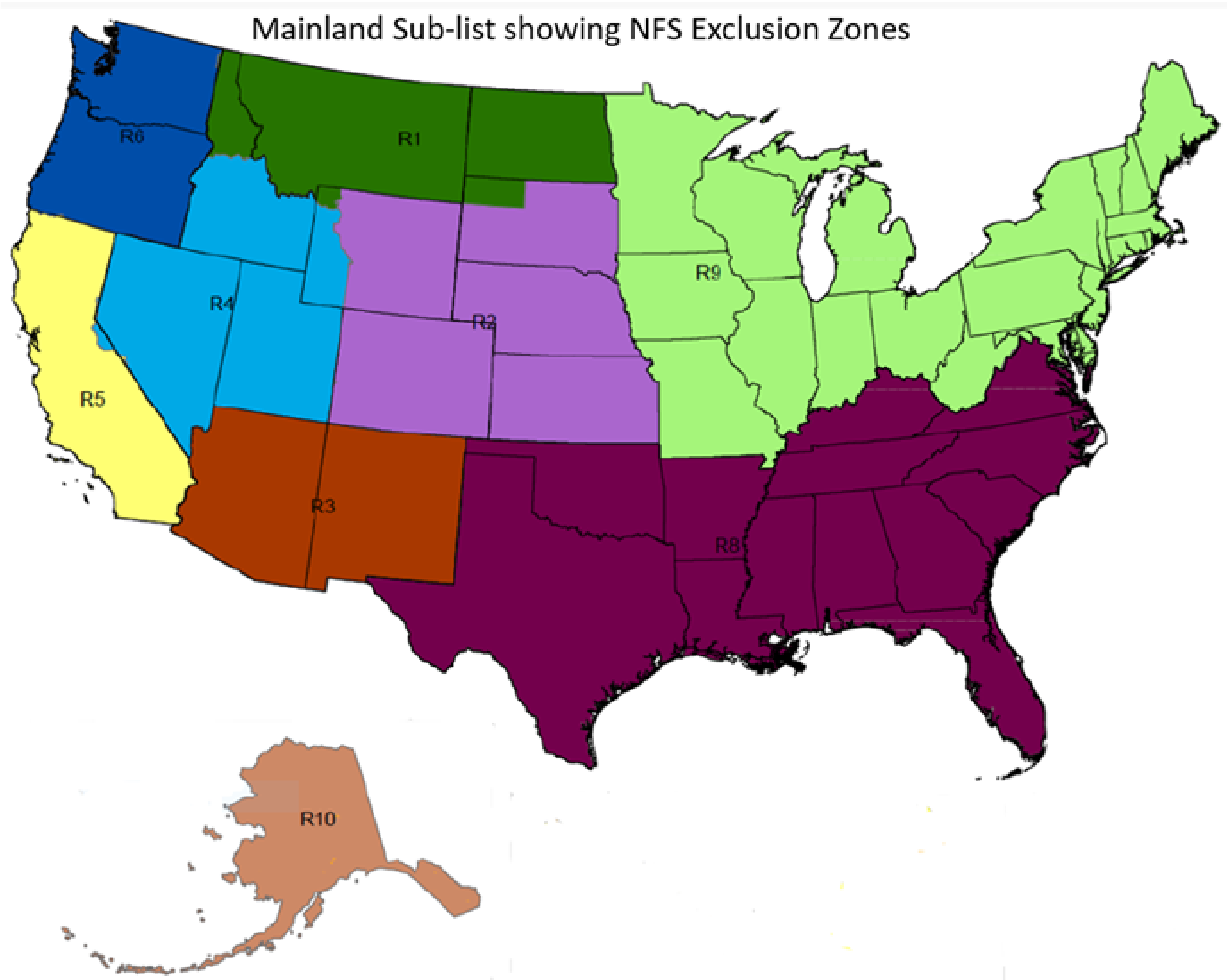


Figure 8.11: Map of the nine P2/3 National Forest System Regional Boundary (NFS) Sub-list areas.

National Forest System (NFS) Regional Boundary Sub-lists; these species are considered shrubs within their associated NFS Region (Figure 8.11 and Table 8.5).

Table 8.5:List of species associated with the nine P2/3 National Forest System Regional Boundary (NFS) Sub-lists

NFS Region Sub-list	Wood-land	FIA code	Common name	Genus	Species	Variety	PLANTS code	Past NRS tally	Past PNW tally	Past RMRS tally	Past SRS tally	Carib-bean	Pacific	Urban	Historic P2
3,4,5,6,10	.	70	larch spp.	Larix	spp.	.	LARIX	R, U	U	U	U	.	.	.	P2
3	w	303	sweet acacia	Acacia	farnesiana	.	ACFA	R, U	P, U	U	R, C, U	C	P	.	P2
5,6,10	.	356	serviceberry spp.	Amelanchier	spp.	.	AMELA	R, U	U	.	R, U	.	.	.	P2
3	.	461	sugarberry	Celtis	laevigata	.	CELA	R, U	PNWS, U	R,U	R, U	.	.	.	P2
3	.	463	netleaf hackberry	Celtis	laevigata	reticulata	CELAR	.	.	.	.	.	.	.	P2
5,6	w	475	curlleaf mountain-mahogany	Cercocarpus	ledifolius	.	CELE3	R, U	PNWS, U	R,U	U	.	.	.	P2
3,4,5,6,10	.	500	hawthorn spp.	Crataegus	spp.	.	CRATA	R, U	U	U	R, U	.	.	.	P2
4,5,6	.	508	oneseed hawthorn	Crataegus	monogyna	.	CRMO3	.	U	U	U	.	.	.	P2
5,6,10	.	510	eucalyptus spp.	Eucalyptus	spp.	.	EUCAL	R, U	P, U	U	R, C, U	C	P	.	P2
5,6,10	.	660	apple spp.	Malus	spp.	.	MALUS	R, U	U	U	R, U	.	.	.	P2
3,4,5,6,10	.	760	cherry and plum spp.	Prunus	spp.	.	PRUNU	R, U	U	U	R, C, U	C	.	.	P2
3	.	763	chokecherry	Prunus	virginiana	.	PRVI	R, U	PNWS, U	.	R, U	.	.	.	P2
3	.	768	bitter cherry	Prunus	emarginata	.	PREM	R, U	PNWS, U	.	U	.	.	.	P2
3,6,8	.	772	sour cherry	Prunus	cerasus	.	PRCE	R, U	U	U	U	.	.	.	P2
3,4	.	805	canyon live oak	Quercus	chrysolepis	.	QUCH2	R, U	PNWS,U	U	U	.	.	.	P2
8	.	845	dwarf chinkapin oak	Quercus	prinoides	.	QUPR	R, U	PNWS, U	U	R, U	.	.	.	P2
3,4,5,8	w	902	New Mexico locust	Robinia	neomexicana	.	RONE	R, U	PNWS, U	.	R, U	.	.	.	P2
8	.	925	coastal plain willow	Salix	caroliniana	.	SACA5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
5,6,10	.	5146	vine maple	Acer	circinatum	.	ACCI	U	U	U	U	.	.	U	.
8	.	5776	storehousebush	Cudrania	tricuspidata	.	CUTR2	U	U	U	U	.	.	U	.
8	.	6524	Chinese fringetree	Chionanthus	retusus	.	CHRE9	.	U	U	U	.	.	U	.
8	.	6918	common buckthorn	Rhamnus	cathartica	.	RHCA3	U	U	U	U	.	.	U	.
3	.	6961	golden dewdrops	Duranta	erecta	.	DUER	U	P, U	U	C, U	C	P	.	.
3	.	7262	Creole cotton	Gossypium	barbadense	.	GOBA	U	P, U	U	C, U	C	P	.	.
8	.	7469	yaupon	Ilex	vomitoria	.	ILVO	U	U	U	U	.	.	U	.
8	w	7577	Japanese privet	Ligustrum	japonicum	.	LIJA	.	U	U	U	.	.	U	.
8	w	7578	glossy privet	Ligustrum	lucidum	.	LILU2	.	U	U	U	.	.	U	.
3,4	.	8111	Jerusalem thorn	Parkinsonia	aculeata	.	PAAC3	U	P, U	U	C, U	C	P	.	.
8	.	8345	Carolina laurelcherry	Prunus	caroliniana	.	PRCA	.	U	U	U	.	.	U	.
5,6,10	.	8420	pear spp.	Pyrus	spp.	.	PYRUS	U	U	U	U	.	.	U	.
8	.	8466	Rose Myrtle	Rhodomyrtus	tomentosa	.	RHTO10	U	P, U	U	U	.	P	.	.
3,8	.	8479	prairie sumac	Rhus	lanceolata	.	RHLA3	U	U	U	U	.	.	U	.
1,2,3,4,5,6,8	.	8504	arroyo willow	Salix	lasiolepis	.	SALA6	.	U	U	U	.	.	U	.
8	.	8631	earleaf nightshade	Solanum	mauritianum	.	SOMA3	U	P, U	U	U	.	P	.	.
3,8	.	8917	Eve's needle	Yucca	faxoniana	.	YUFA	U	U	U	U	.	.	U	.

When Collected:	All trees *(PRESENT TREE STATUS = 0 - 8)*
Field width:	4 digits
Tolerance:	No errors
Values:	*999 (valid only as a downloaded code); Species in Appendix D*

Item 8.5.1.13 AZIMUTH (CORE 5.4)

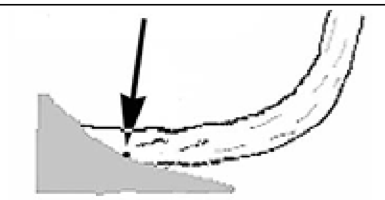
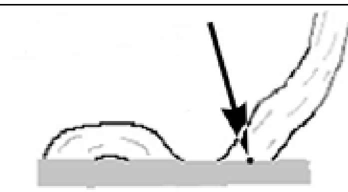
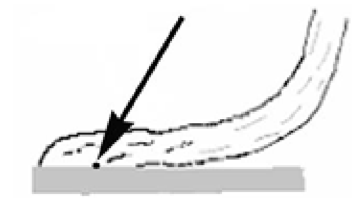
[TREE.AZIMUTH; TREE.PREV_AZM_PNWRS]

Sight the AZIMUTH, to the nearest degree, from the subplot center (for trees ≥ 5.0 inches DBH/DRC) or the microplot center (for trees ≥ 1.0 inch and < 5.0 inches DBH/DRC) by sighting the pith of the tree at the base where it enters the ground using a compass. Sight to the geographic center for multi-stemmed woodland species (Appendix D). The geographic center is a point of equal distance between all tallied stems for a given woodland tree. Record AZIMUTH to the nearest degree. Use 360 for north.

- Use the magnetic declinations shown in Appendix B, Reference Information.
- For pistol butt trees, record the AZIMUTH to the pith where the pith intersects the ground (Figure 8.12 through Figure 8.14 below).
- For Witness-Only Objects, use TREE NOTES to record the location on the object where the azimuth was sighted.

On remeasurement plots (SAMPLE KIND = 2), previous AZIMUTH will be downloaded into the current AZIMUTH field. The current crew is responsible for verifying downloaded data and updating when it is out of tolerance.

For saplings on the microplot that become trees (at the time of plot remeasurement), crews must collect new AZIMUTH information from the subplot center. For trees on the subplot that shrink to become saplings on the microplot at remeasurement, crews must collect new AZIMUTH from the microplot center.

<table>
<tr><td colspan="3">Measure DISTANCE & AZIMUTH to the point where the pith intersects the ground</td></tr>
<tr><td>
Figure 8.12: Pistol butt on sloped ground</td><td>
Figure 8.13: Krummholz situation</td><td>
Figure 8.14: Pistol butt on flat ground</td></tr>
</table>

When Collected:	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC*, and witness-only trees/ stumps/objects. When SAMPLE KIND = 2, downloaded previous AZIMUTH must be verified.*
Field width:	3 digits
Tolerance:	*Tally trees:* +/- 10 degrees
	Witness-only trees/stumps/objects: +/- 4 degrees
Values:	001 to 360

Item 8.5.1.14 HORIZONTAL DISTANCE (CORE 5.5)

[TREE.DIST; TREE.PREV_HORIZ_DIST_PNWRS]

Record the measured HORIZONTAL DISTANCE, to the nearest 0.1 foot, from the subplot center (for trees ≥ 5.0 inches DBH/DRC) or microplot center (for trees ≥ 1.0 inch and < 5.0 inches DBH/DRC) to the pith of the tree at the base. For all multi-stemmed woodland trees (woodland species indicated in Appendix D), the HORIZONTAL DISTANCE is measured from subplot or microplot center to the "geographic center" of the tree. The geographic center is a point of equal distance between all tallied stems for a given woodland tree.

On remeasurement plots (SAMPLE KIND = 2), previous HORIZONTAL DISTANCE will be downloaded into the current HORIZONTAL DISTANCE field. The current crew is responsible for verifying downloaded data and updating when it is out of tolerance. There is no tolerance for added or missed trees regardless of the previous crew's downloaded data. When the old pin or dowel is not found, current cruisers should consider all "edge" trees or saplings that were in or out on the previous occasion when reestablishing the subplot center.

For saplings on the microplot that become trees (at the time of plot remeasurement), crews must collect new HORIZONTAL DISTANCE information from the subplot center.

- For live trees on the subplot that shrink to become saplings on the microplot at remeasurement, crews must collect new HORIZONTAL DISTANCE from the microplot center.

When Collected:	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC. *When SAMPLE KIND = 2, downloaded previous HORIZONTAL DISTANCE must be verified.*
Field width:	*4* digits (*x*xx.y)
Tolerance:	Microplot: +/- 0.2 feet
	Microplot woodland species: +/- 0.4 feet
	Subplot: +/- 1.0 feet from 0.1 to 23.0 ft
	Subplot: +/- 0.2 ft from 23.1 to 24.0 ft
	Subplot multi-stemmed woodland species: +/- 2.0 feet
	Annular plot: +/- 3.0 feet from 24.0 to 55.9 ft
	Annular plot: +/- 1.0 ft from 55.9 to 58.9 feet
	Annular plot woodland species: +/- 6.0 feet
Values:	Microplot: 00.1 to 06.8
	Subplot: 00.1 to 24.0
	Annular plot: 24.1 to 58.9

Item 8.5.1.15 SLOPE DISTANCE TO WITNESS TREE OR OBJECT (PNW)
[TREE.SLOPE_DIST_TO_WITNESS_PNWRS]

Record the SLOPE DISTANCE, to the nearest 0.1 foot, from the base of the subplot center pin, to the head of the nail that affixes the TREE TAG NUMBER/basal tag or other witness object. If more than one nail is used to affix the basal tag, measure to the head of the top nail. If a basal tag cannot be attached to the witness object, or if in wilderness areas or national parks where TREE TAG NUMBER/basal tags cannot be used, measure from the base of the subplot/macroplot to the front of the tree/object at the base.

On remeasurement plots (SAMPLE KIND = 2), previous SLOPE DISTANCE will be downloaded into the current SLOPE DISTANCE field. The current crew is responsible for verifying downloaded data and updating when it is out of tolerance.

When Collected:	All witness trees, stumps, or objects (PRESENT TREE STATUS = 1 or 2 and SUBPLOT TALLY TREE WITNESS FLAG = Y; **or** PRESENT TREE STATUS = 7, 8, or 9). When SAMPLE KIND = 2: previous SLOPE DISTANCE must be verified.
Field width:	3 digits (xxx.y)
Tolerance:	+/- 0.2 feet
Values:	00.1 to 99.9

SECTION 8.6 DIAMETER

Diameters are measured at either breast height (DBH) or at the root collar (DRC). Species requiring DRC, referred to as woodland species, are denoted with a “w” in Appendix D. Trees with diameters between 1.0- and 4.9-inches are measured on the 6.8-foot radius microplots. Those with diameters of 5.0-inches and larger are measured on the 24-foot radius subplots. Additional trees, with diameter breakpoints defined by region, are measured on the macroplot.

Diameters are used in calculating volume, growth, average stand diameter, and stocking-related estimates such as forest type and stand size.

Unless one of the special situations listed in Subsection 8.6.4 is encountered, measure DBH at 4.5 feet above the ground line on the uphill side of the tree.

SUBSECTION 8.6.1 MARKING CURRENT DIAMETER

1. Marking saplings < 3.0 inches DBH and woodland species (regardless of DRC) tallied for the first time:
   - Mark location of diameter measurement with a grease pencil. Each stem of a multi-stemmed woodland species must be marked.
2. Marking live trees ≥ 3.0 inches DBH, or snags ≥ 3.0 inches DBH, tallied for the first time:
   - Set an aluminum nail at the point of diameter measurement. Place the nail on the side of the tree facing subplot/microplot center. **On steep slopes**, where placing the nail towards subplot/microplot center is not possible, place the nail on the uphill side of the bole. The nail should be driven in only as far as is necessary to firmly anchor it in the wood.
   - Use caution to avoid damaging trees.
   - On R6 Forest Service administered lands: use 4 inch nails to mark DBH.
   - Use painted nails (brown, black, or gray) if required by special monumenting protocols for wilderness or national park plots (see Chapter 3, Plot Layout and Referencing).
3. Additional instructions for marking diameter on trees ≥ 32.0 inches:

   If a live tree or snag (new or remeasured) is 32.0 inches DBH/DRC or larger, affix an additional nail, and for every additional 12 inches of diameter add another nail, distributing the nails evenly around the circumference of the bole (e.g., a 44.3 inch tree would have three nails around the circumference of the tree at DBH/DRC – ideally, one on the uphill side of the tree and the other two about 1/3 of the way around the tree on each side). Set these nails while the diameter tape is wrapped around the tree at the point of diameter.
4. Marking DBH on trees previously marked:

   The DBH location on previously tallied trees ≥ 3.0 inches was marked with an aluminum nail. Remeasure diameter at the location of the previous crew's nail if appropriate using the rules below:

   - For live trees: Reset the old nail enough so that as much of the old nail is exposed as possible. If the old nail cannot be pulled out to meet this requirement, set a new nail at the same location.
   - For dead trees: Pound the nail flush with the bole.
   - If the point of DBH measurement is being moved (on live or dead trees), follow the instructions outlined in Item 8.6.4.1, PREVIOUS DIAMETER AT BREAST HEIGHT (CORE 5.9.1) to estimate a new PREVIOUS DIAMETER AT BREAST HEIGHT.
   - If the old nail marks a point of diameter measurement not used at the current inventory, remove it if possible; otherwise pound it in flush with the tree.
   - If the previous nail placement is in the correct location, but is not facing subplot center, keep original placement of nail unless there is an obvious error.

SUBSECTION 8.6.2 REMEASUREMENT TREES

<u>When remeasuring the diameter of a tree tallied at a previous survey, take the measurement at the location monumented by the previous crew. See exceptions below for when it is acceptable to move the previous diameter location. If the diameter location is out of reach, estimate diameter at the previous diameter location (normally 4.5 feet unless forking rules apply). Assign a DIAMETER CHECK code of 2 whenever the point of measurement is moved.</u>

<u>There are four exceptions when it is necessary to move the diameter measurement location:</u>

1. <u>When there is an abnormality or irregularity (e.g. bulge or branch) at the previous DIAMETER measurement point, move the diameter above the abnormality/irregularity. If not possible to reach this location, move the diameter below the abnormality/irregularity at the best repeatable location but do not go below stump height of 1.0 foot. If unable to move the diameter above or below, or normal stem form does not exist, then estimate diameter at the prescribed location (normally 4.5 feet unless forking rules apply) regardless of the previous diameter location).</u>
2. <u>When the Measure Low Approach is applied for the first time to a remeasured tree.</u>

3. When it is not possible to retain the previous diameter measurement location, move the diameter location to obtain the correct number of trees. For example, if at the previous measurement a forked tree was tallied in error as one tree, but now qualifies as two separate trees, move the diameter measurement point to obtain two distinct DBH measurement locations. Alternately, if two forks were tallied at the previous visit, but only one should be tallied at the current visit, move the diameter measurement point to obtain one DBH measurement location.
4. When previous diameter measurement location is now less than 1 foot from current ground level (e.g., due to a mudslide or avalanche), measure up from the current ground level to establish a new DBH measurement location. See Figure 8.15.

Do not move the diameter measurement point or change PREVIOUS DIAMETER for subjective differences in interpretation of forked trees. Only gross errors made by the previous crew should be corrected, and if the tree qualifies for the measure low approach or has branch like stems that were previously tallied. If in doubt, use the previous crew's interpretation of the forked trees.

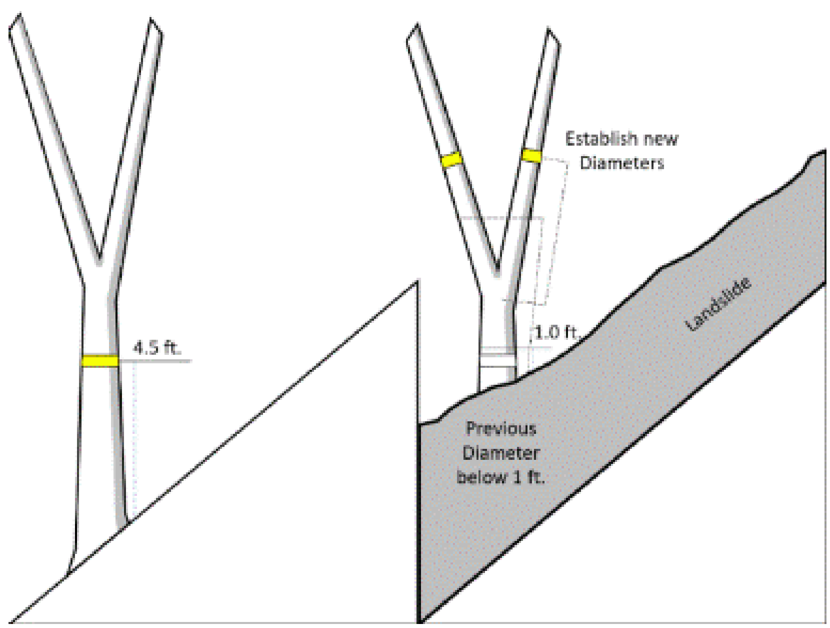


Figure 8.15: Example of a tree requiring a new DBH measurement location.

The following apply at remeasurement:

1. If at Time 1 a forked tree was recorded as two separate trees but should have been recorded as one, or new protocols allow for only one, reconcile one tree record as PRESENT TREE STATUS = 0 and move the diameter to the correct measurement location for the remaining tree record. The remaining tree record receives PRESENT TREE STATUS = 1 or 2 with DIAMETER CHECK = 2, and a TREE NOTE at Time 2.

   Use the following method for trees that were erroneously tallied at Time 1 under previous forking protocol, and the forked tree should be recorded as a single tree at Time 2 under current forking protocol. This applies when there was an obvious mistake at the previous visit. Assign trees that drop out of the inventory the following:

   • PRESENT TREE STATUS = 0
   • RECONCILE = 7
   • TREE NOTE explaining the situation

   It may be difficult to determine if an error was made at the previous visit, and trees could also drop out of the current inventory due to changes in forking protocol. For trees that appear to be correctly tallied at Time 1, but at Time 2 no longer qualify under the current forking protocol, assign trees that drop out of the inventory the following:

   • PRESENT TREE STATUS = 0
   • RECONCILE = 8
   • TREE NOTE explaining the situation

2. If at Time 1 a forked tree was recorded as one tree but should have been recorded as two separate trees, use the existing tree record to represent one of the forks and move the diameter to the correct measurement location of this remeasured tree. Code PRESENT TREE STATUS = 1 or 2, DIAMETER CHECK = 2, and a TREE NOTE.

   Use the following method for trees that were erroneously not tallied at Time 1 and remain an error under current forking protocol at Time 2. This applies when there was an obvious mistake at the previous visit. Assign the missed tree the following:

   - PRESENT TREE STATUS = 1 or 2
   - RECONCILE = 7
   - TREE NOTE explaining the situation

   Use the following method for trees that were correctly not tallied at Time 1 but now are tallied using current forking protocol at Time 2. Assign trees that move into the inventory the following:

   - PRESENT TREE STATUS = 1 or 2
   - RECONCILE = 8
   - TREE NOTE explaining the situation

   For new trees that grow into the inventory and qualify as a fork under the current protocol, create a new record for the ingrowth tree and assign the new tree the following:

   - PRESENT TREE STATUS = 1 or 2
   - RECONCILE = 1

3. For remeasurement of a group of multiple forks (≥3) that originate from approximately the same point on the main stem at Time 1 that are now recorded as a single tree using the **Measure Low Approach** (See Glossary) at Time 2, select one of the group to represent the resulting single tree (choose the "most representative" of the group in relation to the resulting tree) to measure at Time 2, and record a current diameter based on the **Measure Low Approach** guidelines and assign the following:

   - DIAMETER CHECK = 2
   - LENGTH TO DIAMETER MEASUREMENT POINT
   - TREE NOTE explaining the situation

   The remaining forks that were measured at Time 1 are now considered part of this single tree (branches). The tree records for these are retired with the following:

   - PRESENT TREE STATUS = 0
   - RECONCILE = 8
   - TREE NOTE explaining the situation

   When a tree diameter was too small at the forked locations to meet diameter threshold at Time 1, but now at Time 2 it meets the limiting diameter for subplot or macroplot using the measure low approach, assign the following:

   - PRESENT TREE STATUS = 1 or 2
   - RECONCILE = 8
   - TREENOTE explaining the situation

4. Core 8.0 introduced updated definitions on how to define a branch versus a stem based on form and function. See #1 Forked tree under Special DBH situations. In order to qualify as a fork, the stem in question must be at least 1/3 the diameter of the main stem AND must branch out from the main stem at an angle of 45 degrees or less, AND must be judged to have, or have the potential to assume an obvious "tree-like" form and function as opposed to an obvious "branch-like" form and function - all three requirements must be satisfied. For example, if a stem tallied at Time 1 is exhibiting "branch-like" form and is leaning at an angle less than 45 degrees from vertical at Time 2, it is no longer considered a tree. Assign trees that drop out of the inventory the following:

   - PRESENT TREE STATUS = 0
   - RECONCILE = 8
   - TREE NOTE explaining the situation

   Trees moving into the inventory based on this situation will be unlikely, but assign these new trees the following:

   - PRESENT TREE STATUS = 1 or 2
   - RECONCILE = 8

- TREE NOTE explaining the situation

For new trees that grow into the inventory, create a new record for the ingrowth tree and assign the new tree the following:

- PRESENT TREE STATUS = 1 or 2
- RECONCILE = 1
- TREE NOTE explaining the situation

5. **WOODLANDS:** If at the previous visit a multi-stemmed tree was recorded as two or more separate trees but should have been recorded as one tree, assign one of the tree records the following:
   - PRESENT TREE STATUS = 0,
   - RECONCILE = 7 or 8,
   - TREE NOTE explaining the situation.

   The remaining tree data line receives

   - PRESENT TREE STATUS = 1 or 2
   - DIAMETER CHECK = 2,
   - TREE NOTE explaining the situation.
6. **WOODLANDS:** If at the previous visit a multi-stemmed tree was recorded as one tree but should have been recorded as two or more separate trees, correct the PREVIOUS DIAMETER for the remeasured tree to represent one of the two or more trees encountered at this visit. Add the other stem(s) as missed tree(s). Use the existing tree record to represent one of the trees and assign it as follows:
   - PRESENT TREE STATUS = 1 or 2,
   - DIAMETER CHECK = 2, and
   - TREE NOTE explaining the situation.

   The second (third, etc.) tree would get

   - PRESENT TREE STATUS = 1 or 2,
   - RECONCILE 7,
   - and a TREE NOTE.

   Note: The current crew should not correct for subjective differences in interpretation of multi-stemmed trees; i.e., only gross errors made by the previous crew should be corrected. If in doubt, use the previous crew's interpretation of the multi-stemmed trees.

SUBSECTION 8.6.3 DIAMETER ON STUMPS

Diameter on stump < 4.5 feet tall: Use a logger's tape, cloth tape or ruler to measure the longest and shortest axes across the top of the stump. Record diameter as the average of the two measurements.

SUBSECTION 8.6.4 DIAMETER AT BREAST HEIGHT

Special DBH situations:

1. **Forked tree:** In order to qualify as a fork, the stem in question must be at least 1/3 the diameter of the main stem and must branch out from the main stem at an angle of 45 degrees or less (Figure 8.16 - Figure 8.20), AND must be judged to have, or have the potential to assume an obvious "tree like" form and function as opposed to an obvious "branch like" form and function. If there is any doubt as to the form and function of a potential fork, call it a fork instead of a branch. Figure 8.20 provides examples where the form and function are considerations. Forks originate at the point on the bole where the piths intersect. Forked trees are handled differently depending on whether the fork originates below 1.0 foot, between 1.0 and 4.5 feet, or above 4.5 feet. Seedling-sized stems, (i.e., stems that are less than 1 inch in diameter at the point of attachment or at the prescribed diameter location, 3.5 feet above pith separation), are not considered forks.

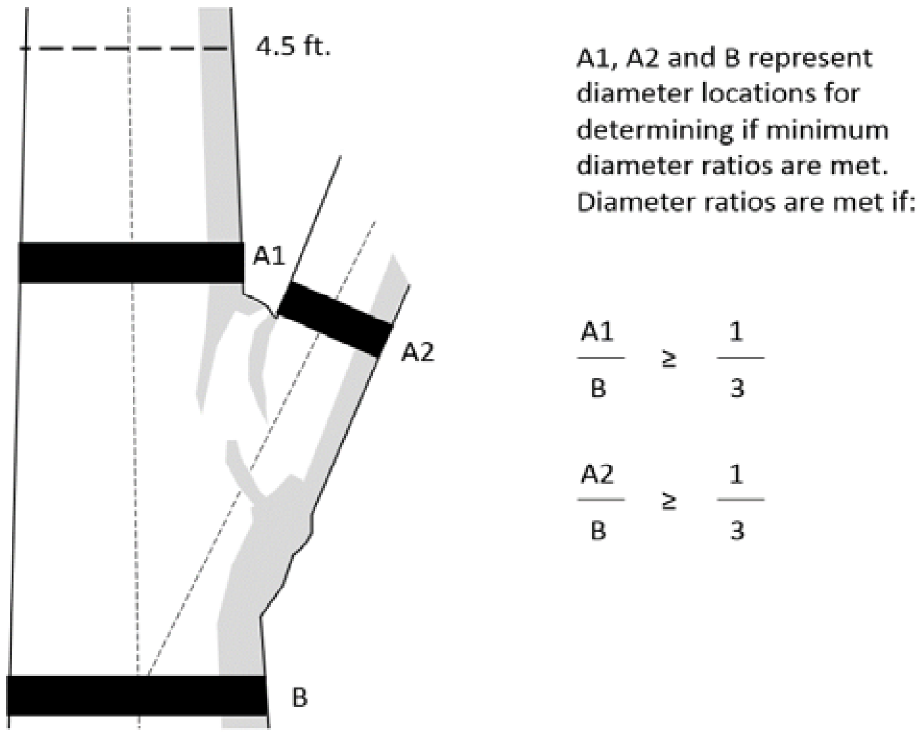


Figure 8.16: **Determining diameter ratio of forks.** When determining if a fork meets the 1/3 diameter requirement for qualifying as a fork, the diameter of the potential fork taken at locations A1 and A2 must be 1/3 of the diameter at location B.

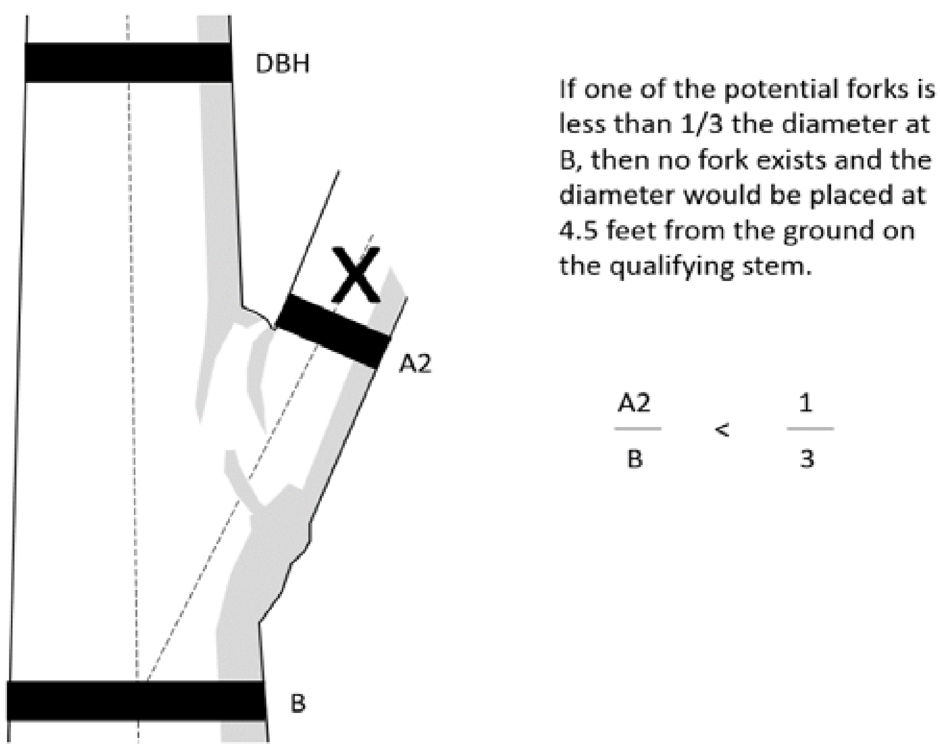


Figure 8.17: **A single non-qualifying fork.** If one of the forks does not meet the minimum ratio, then no fork exists and the diameter is placed at the normal location on the dominant stem.

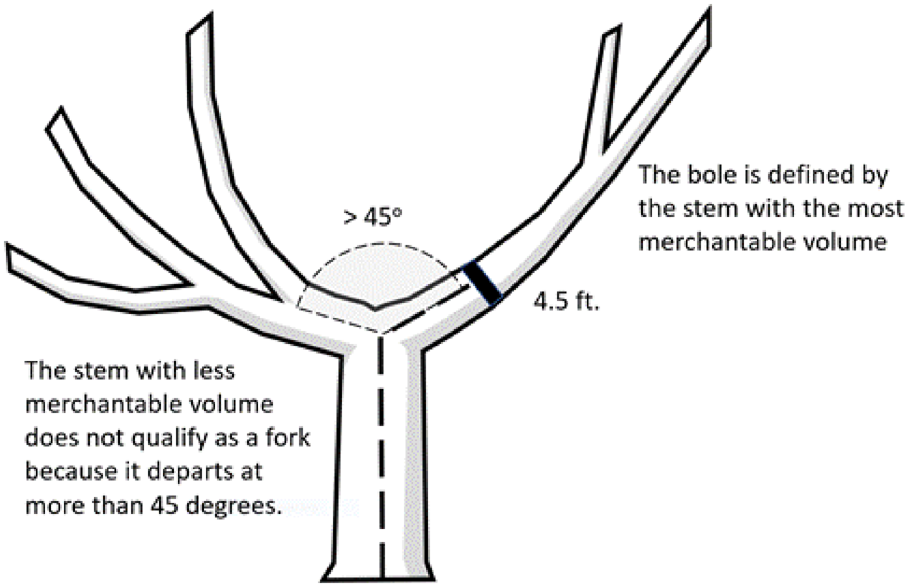


Figure 8.18: The stem with the most merchantable volume is considered the Bole (main stem) of the tree. Because the prospective fork on the left occurs at an angle greater than 45 degrees from the main stem, it does not qualify as a fork and is considered a branch. The diameter is then placed at the normal location on the main stem.

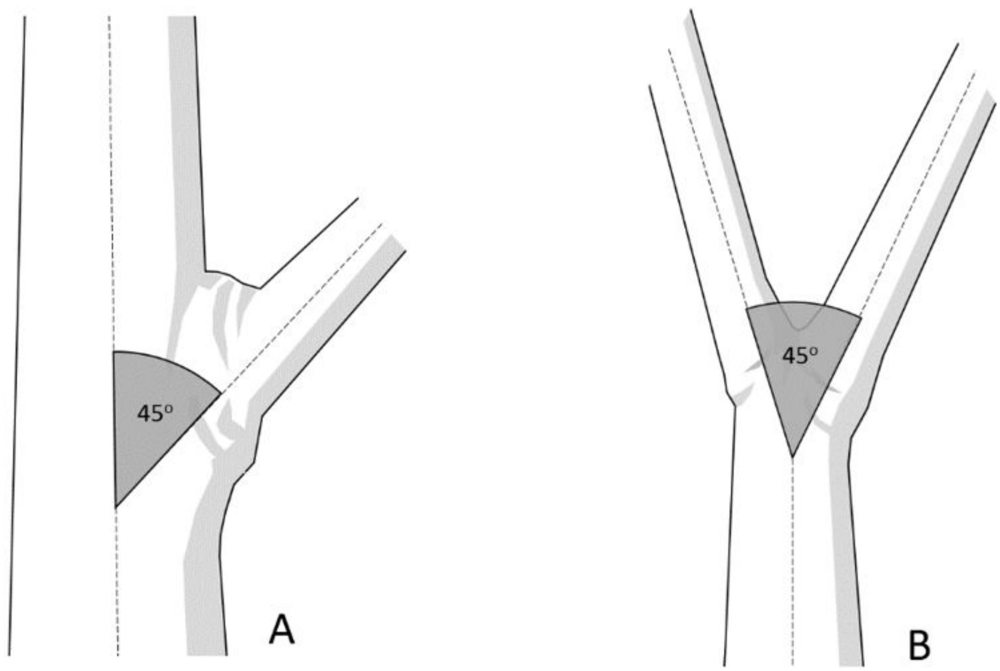


Figure 8.19: Forking angle. In order to qualify as a fork, the piths must diverge at an angle not exceeding 45 degrees from the main stem (A). In cases where there is no obvious main stem (B), consider the angle of pith separation between the two stems.

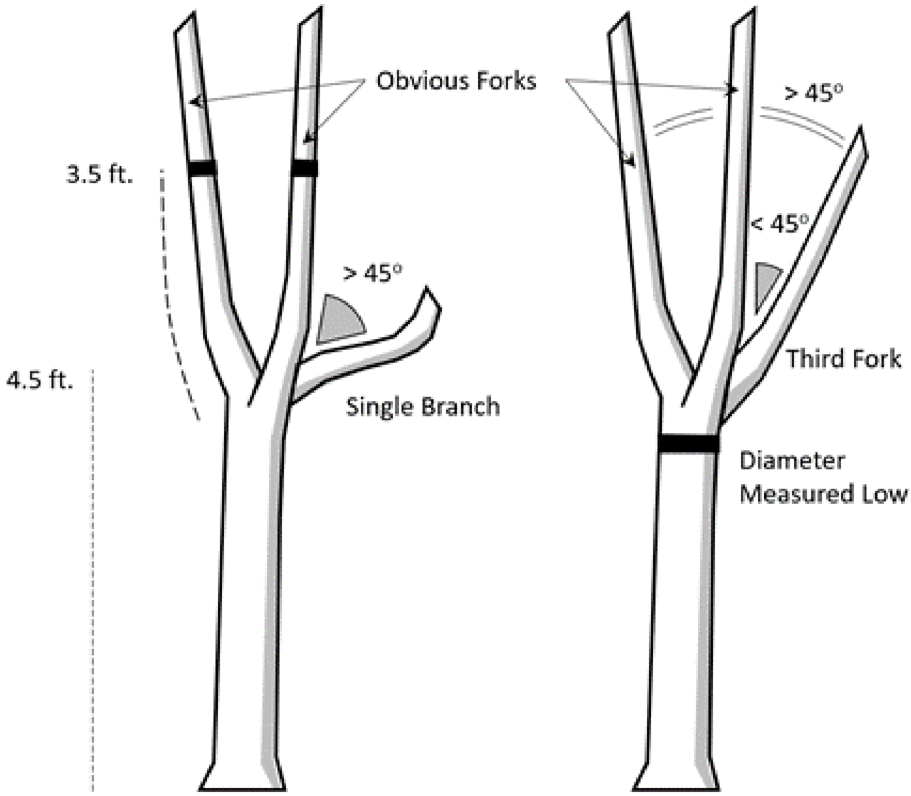


Figure 8.20: The tree on the left has two stems that are clearly forks and a single branch that departs at an angle of greater than 45 degrees from either existing fork. This branch is ignored when placing diameters. The tree on the right also has two stems that clearly qualify as forks, plus a third stem that is within 45 degrees of one fork, but not the other. So long as it is within 45 degrees of an adjacent qualifying fork, it too is considered a fork. In this case, it is the third fork from approximately the same location on this tree and the **Measure Low Approach** must be applied.

A. **Trees forked below 1.0 foot:** Trees forked below 1.0 foot are treated as distinctly separate trees (Figure 8.21). Distances and azimuths are measured individually to the center of each stem where it splits from the stump (Figure 8.26 A-C). DBH is measured for each stem at 4.5 feet above the ground. When stems originate from pith intersections below 1 foot, it is possible for some stems to be within the limiting distance of the microplot or subplot, and others to be beyond the limiting distance. If stems originating from forks that occur below 1.0 foot fork again between 1.0 and 4.5 feet (Figure 8.26-E), the rules in the next paragraph apply.

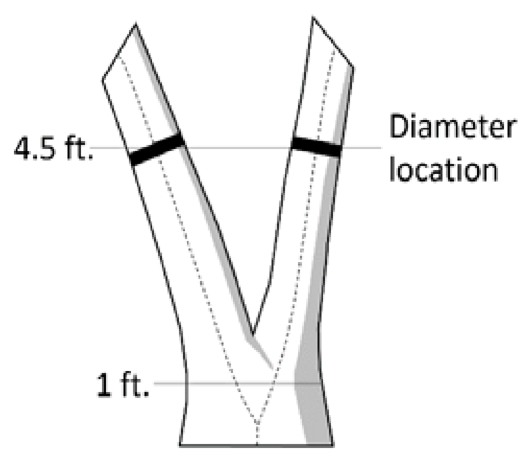


Figure 8.21: Forked below 1.0 foot.

B. **Trees forked between 1.0 foot and 4.5 feet:**
Trees forked between 1.0 foot and 4.5 feet (see Figure 8.22) are *tallied* as separate trees, but *the same* distance and azimuth (to the central stump) is recorded for each stem (Figure 8.26 D-F). Although a single azimuth and distance applies to all, multiple stems should be recorded as they occur in clockwise order (from front to back when one stem is directly in front of another). The DBH of each fork is measured at a point 3.5 feet above the pith intersection. When forks originate from pith intersections between 1.0 and 4.5 feet, the limiting distance is the same for all forks – they are either all on, or all off the plot.

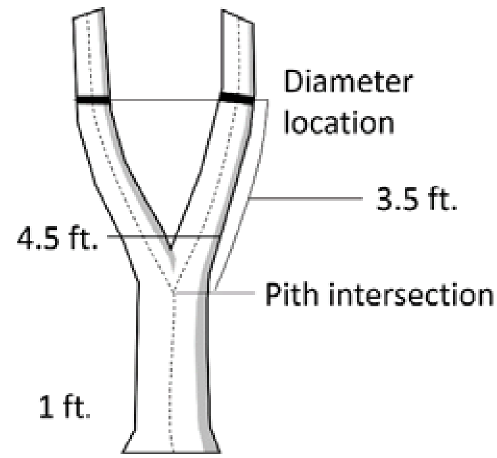


Figure 8.22: Forked between 1.0 foot and 4.5 feet.

Measure Low Approach

Crews may encounter trees of any species displaying growth forms with multiple forks that make applying traditional forking rules very difficult. In some instances these growth forms are species specific and in others they are the result of either the immediate growing conditions or the fact that the trees have been bred, pruned, or managed in a way that promotes multiple stems resulting in a specific crown shape.

In cases where such multiple forks (≥3) all originate from approximately the same point on the main stem, follow the **Measure Low Approach**, where the diameter is taken at the highest, most repeatable location between the 1-foot stump and initial pith separation. This approach is applicable in instances where any of the following are present between the 1-foot stump and DBH (4.5 feet):

1. Multiple forks (≥3) (Figure 8.23 D).
2. Prolific branching originating from approximately the same location that prevents accurate and repeatable diameter (Figure 8.23 A and B). Prolific branching, as defined here, are those trees that often lack a defined main stem and/or qualifying forks, and take on a bushy appearance as the lower bole splits out into multiple branches at or below 4.5 feet. This is a rare situation that should not be confused with normal branching patterns that allow for accurate diameter placement (Figure 8.23 C).
3. Any combination of multiple forks (≥3) and prolific branching originating at approximately the same location.
4. The stems of a forked tree are grown together in such a fashion that an accurate DBH cannot be measured or estimated due to deformation resulting from the presence of the above mentioned criteria (Figure 8.33).

Figure 8.23 and Figure 8.24 illustrate a combination of forks and or branches all originating at the approximate. same location will trigger a measure low approach.

Figure 8.23: Both A and B are examples of Prolific Branching where the Measure Low Approach must be implemented causing the diameter to be taken below 4.5 feet. Although C has many branches, it is not a candidate for the Measure Low Approach because the branching is not deemed "Prolific"; traditional DBH measurement protocols would apply. D is an example of multiple forks originating from approximately the same area. Similar to Prolific Branching, the diameter is taken low, and D is treated as one tree.

A tree can only fork once. Following are specific procedures to secondary forking:

Once a stem is tallied as a fork that originated from a pith intersection between 1.0 and 4.5 feet, do not recognize any additional forks (or potential forks) that may occur on that stem. Secondary forks need only meet the 1/3 diameter and 45 degree requirements to be considered forks; they do not need to be tree-like or 1 inch in diameter. When such secondary forks are encountered, measure/

estimate the diameter of such stems at the most repeatable location below stem separation but above the **first** pith separation (Figure 8.26 F-I) while attempting to avoid measuring double piths (Figure 8.33) where possible (i.e., do not move the point of diameter the entire 3.5 feet above the first fork).

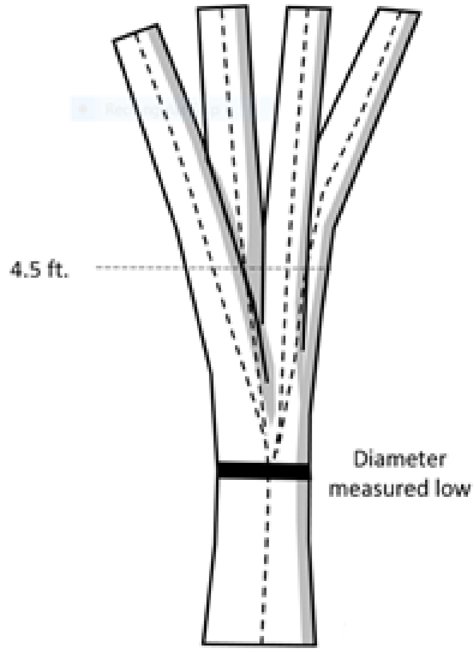


Figure 8.24: Using pith separation to determine diameter locations. In this example it is clear that all piths appear to separate from approximately the same location; this triggers the "Measure Low Approach". In cases where the piths do NOT originate within approximately the same location, normal forking rules are applied as demonstrated in Figure 8.26 A-D and F-I.

C. **Trees forked at or above 4.5 feet:** Trees forked at or above 4.5 feet count as one single tree (Figure 8.25). If a fork occurs at or immediately above 4.5 feet, measure diameter below the fork just beneath any swelling that would inflate DBH.

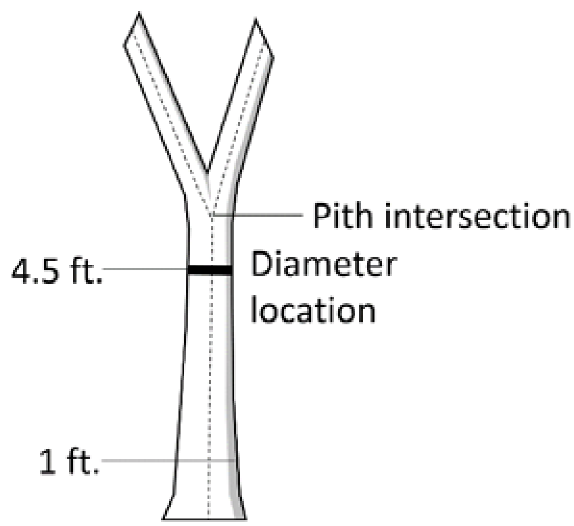


Figure 8.25: One Tree.

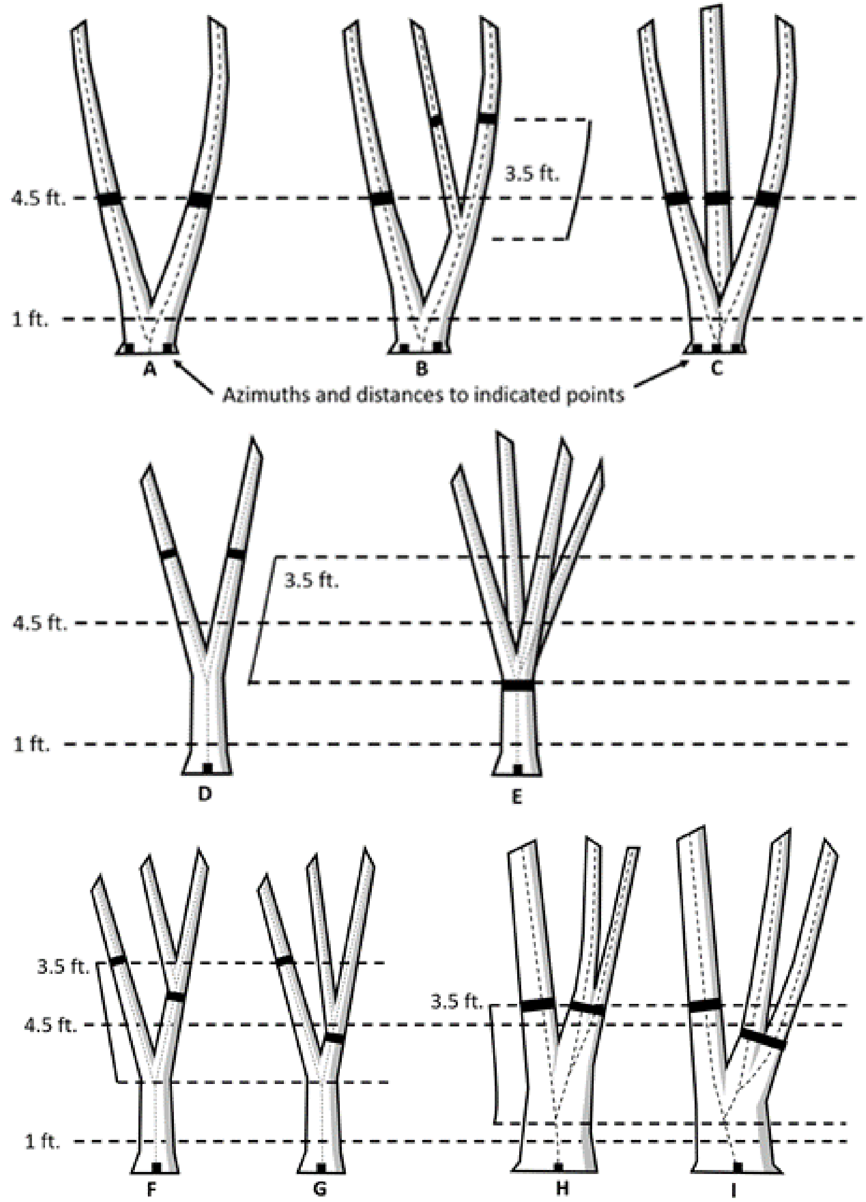


Figure 8.26: Summary of where to measure diameter, distance and azimuth on trees that fork below 1.0 foot (A, B, C) and trees that fork above 1.0 foot (D, E, F, G, H, I). Figure E represents the **"Measure Low Approach".** Figures F and G represent secondary forks with abnormal diameters at stem separation. Figures H and I represent secondary forks with normal diameters at stem separation.

2. **DBH tree stump sprouts:** "Stumps" are created when it is obvious that the bole of a tree has died, broken off, or been cut at or below the diameter measurement point. If it is not obvious, do not consider it a stump and follow normal forking rules. Stump sprouts are new sprouts that originate between ground level and 4.5 feet after the creation of the stump. Stump sprouts are required to have tree-like form and function but are not required to depart the stump at a 45-degree angle or less, nor are they required to have 1/3 the diameter of the stump. Once identified as a stump sprout, all forking rules apply to the resulting sprout. Stump sprouts originating below 1.0 foot are measured at 4.5 feet from ground line. Stump sprouts originating between 1.0 foot and 4.5 feet are measured at 3.5 feet above their point of occurrence. As with forks, rules for measuring distance and azimuth depend on whether the sprouts originate above or below 1.0 foot. After a sprout has been tallied as a stump sprout at Time 1 continue to tally as a stump sprout at Time 2 unless there was an obvious error at Time 1.

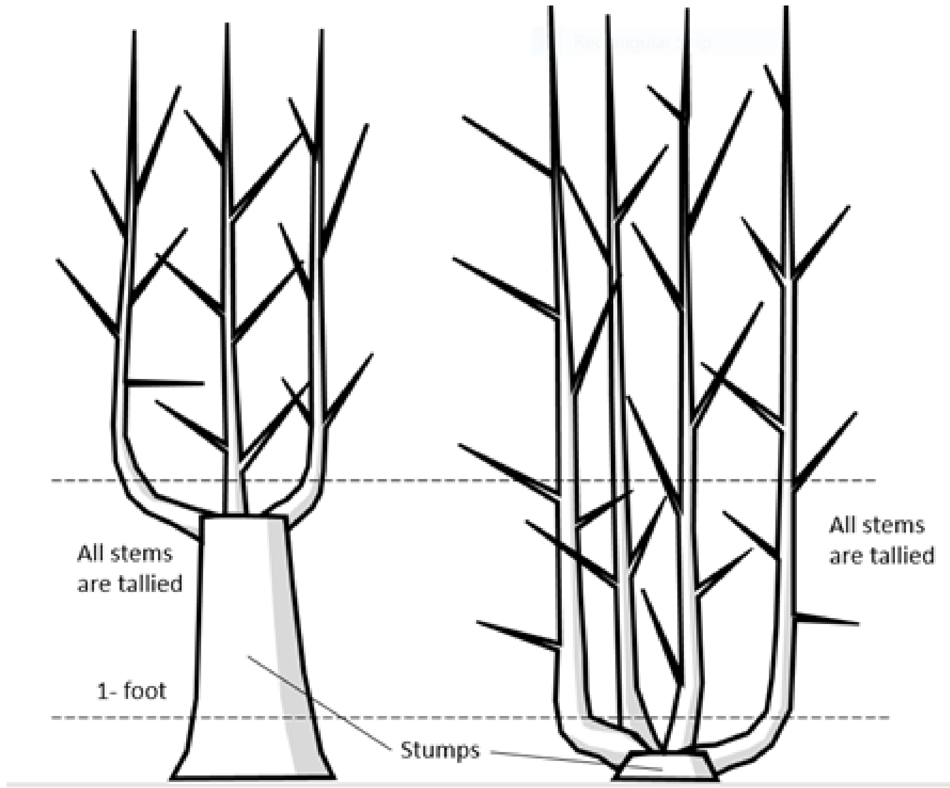


Figure 8.27: For sprouts originating from stumps below 4.5 feet from the ground, the forking rules are not applied when defining each initial sprout. All tree-like sprouts are tallied. Once defined as a stump sprout normal forking rules are applied to the resulting sprout. For stump sprouts originating between 1.0 and 4.5 feet, sprout diameters are taken 3.5 feet above the point of occurrence. For stump sprouts originating below 1.0 foot, sprout diameters are taken at the normal location.

3. **Tree with butt-swell or bottleneck:** Measure these trees 1.5 feet above the end of the swell or bottleneck if the swell or bottleneck extends 3.0 feet or more above the ground (Figure 8.28).

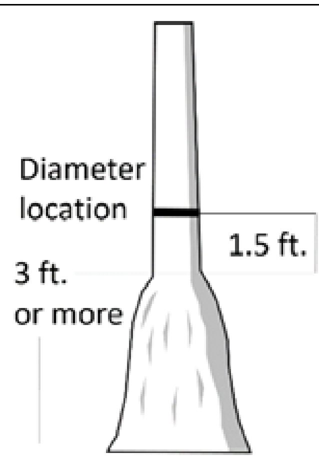


Figure 8.28: Bottleneck tree *(butt swell)*

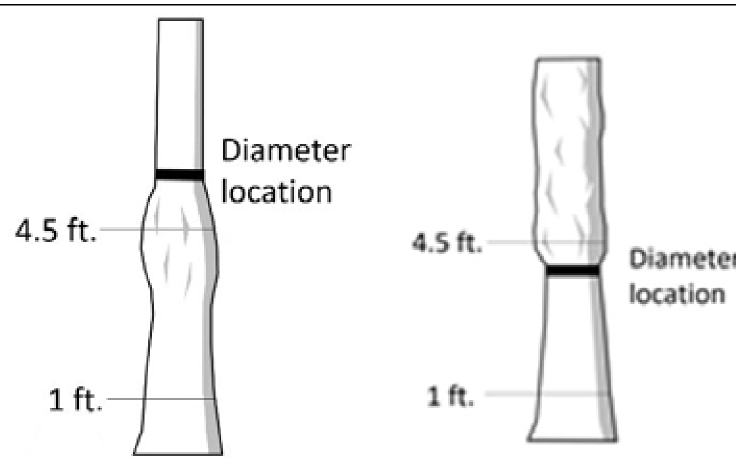


Figure 8.29: Trees with swelling *4.5 feet*

4. **Tree with irregularities at DBH:** On trees with swellings (Figure 8.29), bumps, depressions, and branches (Figure 8.30) at DBH, diameter will be measured immediately above the irregularity at the place it ceases to affect normal stem form (Figure 8.28 through Figure 8.30). If the diameter point is out of reach above the irregularity, the diameter will be measured below the irregularity at the best

repeatable location. If normal stem form does not exist, the diameter will be estimated at the prescribed location.

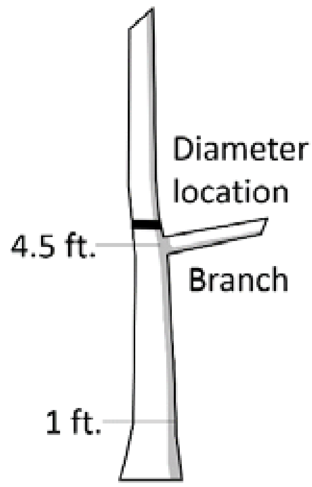


Figure 8.30: Tree with a branch at 4.5 feet

5. **Tree on slope:** Measure diameter at 4.5 feet from the ground along the bole on the uphill side of the tree (Figure 8.31).
6. **Leaning tree:** Measure diameter at 4.5 feet from the ground along the bole. The 4.5 foot distance is measured along the underside face of the bole (Figure 8.32).

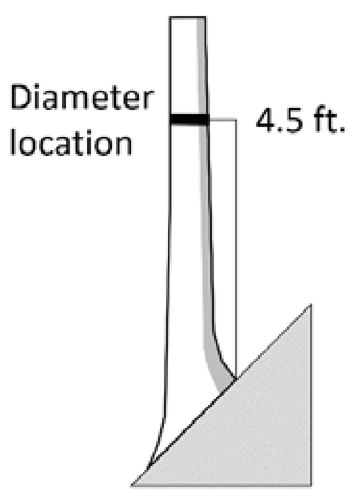


Figure 8.31: Tree on a slope.

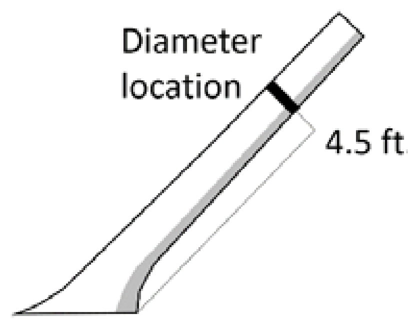


Figure 8.32: Leaning tree.

7. **Turpentine tree:** On trees with turpentine face extending above 4.5 feet, estimate the diameter at 10.0 feet above the ground and multiply by 1.1 to estimate DBH outside bark.
8. **Independent trees that grow together:** If two or more independent stems have grown together at or above the point of DBH (Figure 8.33), continue to treat them as separate trees. Set two diameter nails at DBH halfway around the tree's circumference from each other (after placing 1st nail, stand back from bole; take azimuth to nail; on opposite side of bole, place nail where the back azimuth of the first nail lines up). Measure the distance between the nails with a diameter tape making sure zero is aligned and not the hook at the end of the diameter tape with one diameter nail. Multiply the measurement by 2 and record the result as the current diameter. Example: Distance measured = 12.8 inches (12.8 X 2) = 25.6 inches. Set the DIAMETER CHECK code to “7”.

   If unable to use the “Double Nail Method” estimate the diameter of each, set the “DIAMETER CHECK” code to *“1“*, and explain the situation in *TREE NOTES*.

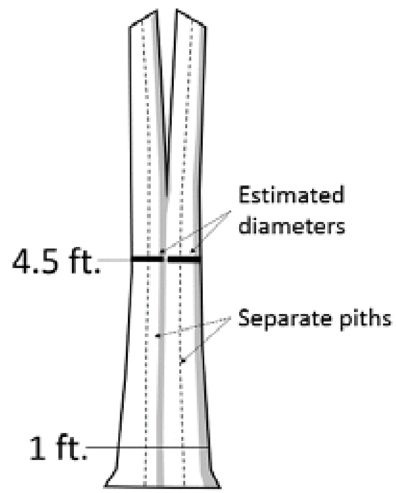


Figure 8.33: Independent trees grown together.

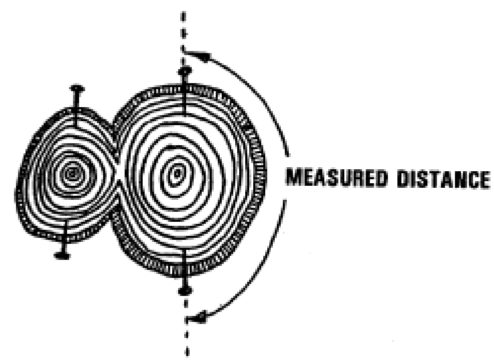


Figure 8.34: Independent trees growing together.

9. **Missing wood or bark:** Do not reconstruct the DBH of a tree that is missing wood or bark at the point of measurement *(*Figure 8.35*)*. Record the diameter, to the nearest 0.1 inch, of the wood and bark that is still attached to the tree. If a tree has a localized abnormality (gouge, depression, etc.) at the point of DBH, apply the procedure described for trees with irregularities at DBH.
10. **Live windthrown tree:** Measure from the top of the root collar along the length to 4.5 feet (Figure 8.36).

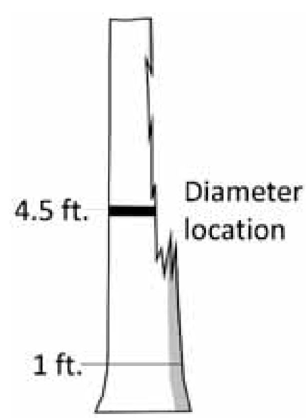


Figure 8.35: Tree with part of stem missing.

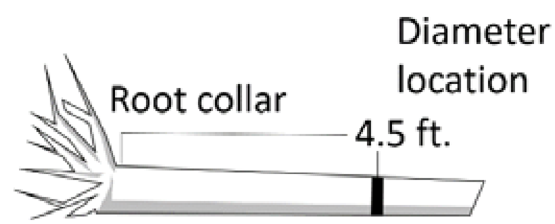


Figure 8.36: Tree on the ground.

11. **Down live tree with tree-form branches growing vertical from main bole:** When a down live tree, touching the ground, has vertical (less than 45 degrees from vertical) tree-like branches coming off the main bole, determine whether or not the pith of the main bole (averaged along the first log of the tree) is above or below the duff layer. These procedures also apply to dead trees that met these same conditions prior to death.
    - If the pith of the main bole is above the duff layer, use the same forking rules specified for a forked tree, and take all measurements accordingly *unless:*

- If the pith intersection of the main down bole and vertical tree-like branch occurs below 4.5 feet from the stump along the main bole, treat that branch as a separate tree, and measure DBH 3.5 feet above the pith intersection for both the main bole and the tree-like branch (Figure 8.37).

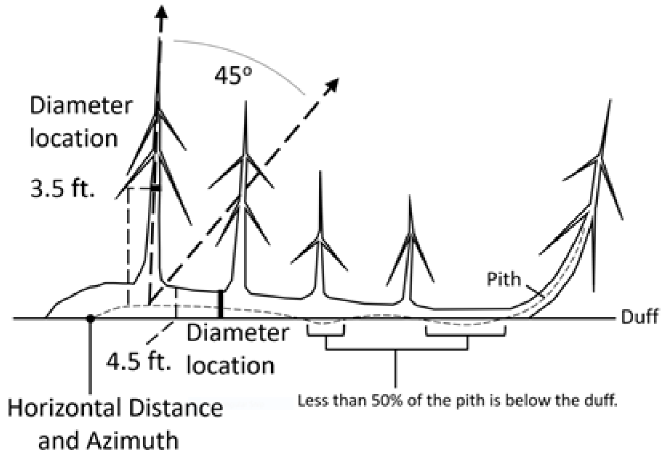


Figure 8.37: Down tree with pith above duff.

- If the intersection between the main down bole and the tree-like branch occurs beyond the 4.5 foot point from the stump along the main bole, treat that branch as part of the main down bole *(Figure 8.38)*.

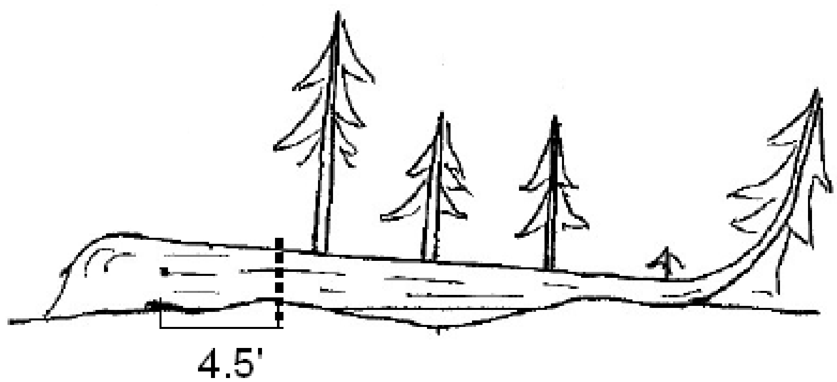


Figure 8.38: Branch beyond 4.5 feet from stump.

- If the pith of main tree bole is below the duff layer, ignore the main bole, and treat each tree-like branch as a separate tree; take DBH and length measurements from the ground, not necessarily from the top of the down bole (Figure 8.39). However, if the top of the main tree bole curves out of the ground towards a vertical angle, treat that portion of that top as an individual tree originating where the pith leaves the duff layer. This is also the point from which the tree is judged in or out of the sample and where DISTANCE and AZIMUTH are measured to.

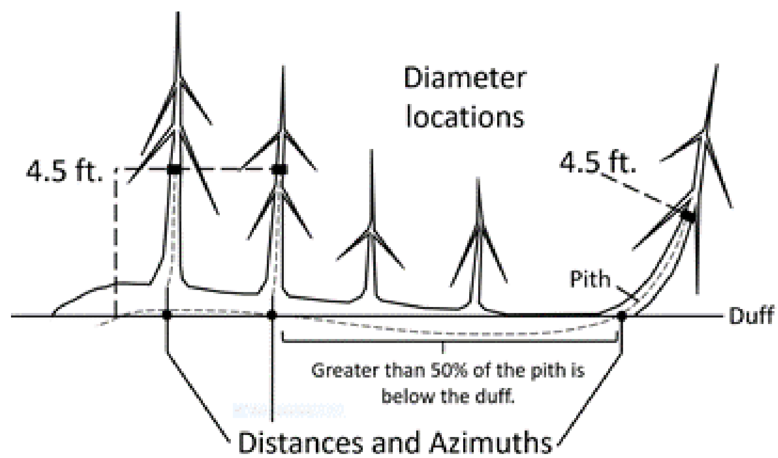


Figure 8.39: Down tree with pith below duff.

12. **Tree with curved bole (pistol butt tree)**: Measure along the bole on the uphill side (upper surface) of the tree (Figure 8.40).

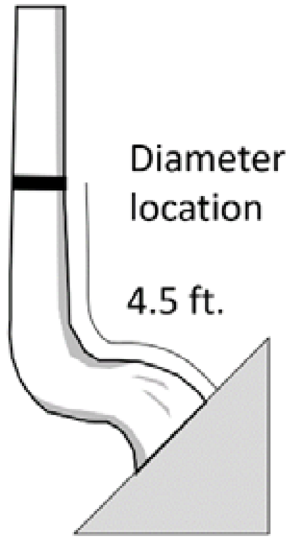


Figure 8.40: Tree with curved bole (pistol butt tree).

13. **Trees with stilted roots or growing on nurse logs**: On trees with stilted roots (e.g., redwood), growing on nurse logs or on top of stumps (not stump sprouts), DBH should be taken at 4.5 feet above the highest point of the root collar of the new tree.

Item 8.6.4.1 PREVIOUS DIAMETER AT BREAST HEIGHT (CORE 5.9.1)
[TREE.PREVDIA_FLD, TREE.HIST_PREV_DIA]

This is the DBH assigned at the previous *annual inventory*. It has been downloaded from the previous inventory. Any change made to this field signifies *a procedural change or* an error at the time of the previous inventory.

Downloaded data should be verified, and updated if one of two situations occurs:

1. The current diameter measurement point is moved to correspond with the corrected location (either because of procedural change, obstruction at old DBH location, or previous crew error in nail location). Remove the original diameter nail and DIAMETER CHECK should be set to “2”. An electronic Tree Note is required to describe the situation.
2. It is clear that there was a typo, illogical value or poorly estimated PREVIOUS DIAMETER AT BREAST HEIGHT. An electronic Tree Note is required to describe the situation.

Estimate the new value for PREVIOUS DIAMETER AT BREAST HEIGHT by doing one of the following:

- Take an increment core at the location of the previous diameter measurement: From the cambium, count back the number of growth rings since the previous visit. Measure this increment to the nearest 1/20 inch and subtract it from the current diameter at previous location. This will provide you with an estimate to correct the PREVIOUS DIAMETER AT BREAST HEIGHT from the same location.
- Measure the diameter at both the correct diameter location and at the previous diameter location. Determine the difference between these two diameters. Add or subtract this value (the difference) to the downloaded value of the PREVIOUS DIAMETER. This will provide an estimate of PREVIOUS DIAMETER corresponding to the corrected location.
- Estimate the correct PREVIOUS DIAMETER based on the "best" information at hand (e.g., the PREVIOUS DIAMETER of similar sized nearby trees of the same species).

When collected:	Downloaded when SAMPLE KIND = 2: all previously tallied trees ≥ 1.0 inch DBH	
Field width:	4 digits (xxx.y)	
Tolerance:	Live trees and dead trees with DECAY CLASS 1, 2	+/- 0.2 inch per 20.0 inch increment of measured diameter.
	Standing dead trees with DECAY CLASS 3, 4, 5	+/- 2.0 inch per 20.0 inch increment of measured diameter.
Values:	001.0 to 999.9	

Item 8.6.4.2 DIAMETER AT BREAST HEIGHT (CORE 5.9.2)
[TREE.DIA]

Unless one of the special situations *listed in Subsection 8.6.4 (Diameter at Breast Height; Special DBH Situations)* is encountered, measure DBH at 4.5 feet above the ground line on the uphill side of the tree. Round each measurement down to the last 0.1 inch. For example, a reading of 3.68 inches is recorded as 3.6 inches.

<table>
<tr><td>When collected:</td><td colspan="2">All live and standing dead tally trees ≥ 1.0 inch DBH, witness-only trees (PRESENT TREE STATUS = 1, 2 or 8); and witness stumps* (PRESENT TREE STATUS = 7)</td></tr>
<tr><td>Field width:</td><td colspan="2">4 digits (xxx.y)</td></tr>
<tr><td rowspan="2">Tolerance:</td><td>Live trees and dead trees with DECAY CLASS 1, 2</td><td>+/- 0.1 inch per 20.0 inch increment of measured diameter.</td></tr>
<tr><td>Standing dead trees with DECAY CLASS 3, 4, 5</td><td>+/- 1.0 inch per 20.0 inch increment of measured diameter.</td></tr>
<tr><td>Values:</td><td colspan="2">001.0 to 999.9</td></tr>
<tr><td colspan="3">*Note: Although stumps do not meet DBH criteria, their DIAMETERS are recorded in this data item.</td></tr>
</table>

SUBSECTION 8.6.5 DIAMETER AT ROOT COLLAR

For species requiring diameter at the root collar (refer to Appendix D), measure the diameter at the ground line or at the stem root collar, whichever is higher. For these trees, treat clumps of stems having a unified crown and common root stock as a single tree; examples include *honey* mesquite, *California* juniper, and *common pinyon*. For woodland trees, record DRC STEM DIAMETER and DRC STEM STATUS (described below). Then compute and record the DRC value from the individual stem diameter information. *The data recorder has a feature to compute DRC.*

Measuring woodland stem diameters: Before measuring DRC, remove the loose material on the ground (e.g., litter) but not mineral soil. Measure just above any swells present, and in a location so that the diameter measurements are a good representation of the volume in the stems (especially when trees are extremely deformed at the base). Stems must be at least 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point to qualify for measurement. Additional instructions for DRC measurements are illustrated in Figure 8.41. For each qualifying stem of the woodland tree, measure and record DRC STEM DIAMETER (Item 8.6.5.2) and indicate the DRC STEM STATUS (Item 8.6.5.3).

Woodland stump sprouts: If all stems of a previously tallied woodland tree were killed, cut or removed and there are new sprouts at the base, treat the previously tallied tree as dead and the new sprouts (1.0-inch DRC and larger) as part of a new tree.

Computing and Recording DRC: For all tally trees requiring DRC, with at least one stem 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point, DRC is computed as the square root of the sum of the squared stem diameters. For a single-stemmed DRC tree, the computed DRC is equal to the single diameter measured.

To avoid calculating DRC by hand, the PDR will perform the calculation automatically. Enter DRC data into the data recorder by pressing Ctrl +P for the tree record of interest to enter the DRC screen.

Use the following formula to compute DRC:

$$DRC = SQRT\ [SUM\ (\text{stem diameter}^2)]$$

Round the result to the nearest 0.1 inch. For example, a multi-stemmed woodland tree with stems of 12.2, 13.2, 3.8, and 22.1 would be calculated as:

$$\begin{aligned} DRC &= SQRT\ (12.2^2 + 13.2^2 + 3.8^2 + 22.1^2) \\ &= SQRT\ (825.93) \\ &= 28.74 \\ &= 28.7 \end{aligned}$$

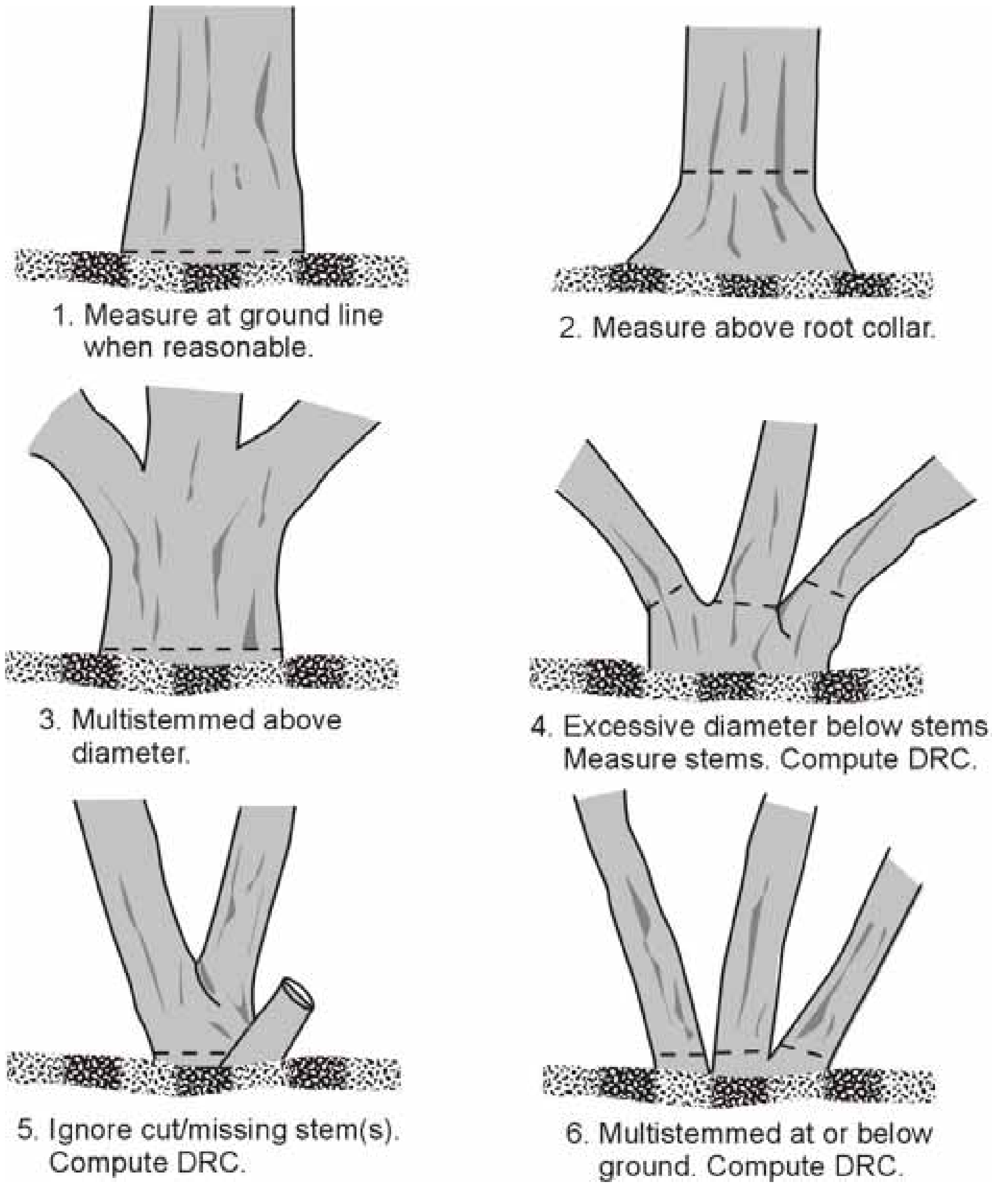


Figure 8.41: How to measure DRC in a variety of situations

Item 8.6.5.1 PREVIOUS DIAMETER AT ROOT COLLAR (CORE 5.9.3)
[TREE.PREVDIA]

This is the DRC assigned at the previous *annual inventory*. It has been downloaded from the previous inventory. Any change made to this field signifies a misclassification at the time of the previous inventory *and should only occur if the previous measurement was off more than 40 percent*. "DIAMETER CHECK" should be set to *"2"* and an explanation is required in the *TREE NOTES* if previous DRC is changed.

When collected:	Downloaded when SAMPLE KIND = 2: all previously tallied trees ≥ 1.0 inch DRC
Field width:	4 digits (xxx.y)
Tolerance:	No errors for updating (when previous measurement was off more than 40 percent).
Values:	001.0 to 999.9

Item 8.6.5.2 DRC STEM DIAMETER (CORE 5.9.4.1)
[TREE.DIA]

Record the diameter of each individual qualifying stem on the woodland tree.

When collected:	All stems on woodland tree species that are at least 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point *when CURRENT NUMBER OF STEMS >0*
Field width:	4 digits (xxx.y)
Tolerance:	+/- 0.2 inches per stem
Values:	001.0 to 999.9

Item 8.6.5.3 DRC STEM STATUS (CORE 5.9.4.2)
[TREE.STATUSCD]

Record the status of each individual stem on the woodland tally tree.

When Collected:	All stems on woodland tree species that are at least 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	live stem
	2	dead stem

Item 8.6.5.4 PAST NUMBER OF STEMS (CORE 5.10)
[TREE.PREV_WDLDSTEM]

If the PAST NUMBER OF STEMS does not equal the CURRENT NUMBER OF STEMS, **do not** change the *downloaded* value. Make a note in TREE NOTES suggesting the possible reason for the difference.

When Collected:	*Downloaded when* SAMPLE KIND = 2
Field width:	2 digits
Tolerance:	No errors
Values:	1 to 99

Item 8.6.5.5 CURRENT NUMBER OF STEMS (CORE 5.11)
[TREE.WDLDSTEM]

Record the total number of stems that were measured for DRC (e.g., record 1 stem as 01; record 12 stems as 12). Count only the number of qualifying stems used to calculate DRC. Qualifying stems are those that are at least 1.0 foot in length and at least 1.0 inch in diameter, 1 foot up from the measurement point.

When Collected:	For tallied **woodland** species with at least one stem 1.0 inches in diameter or larger; includes woodland species tallied on the microplot
Field width:	2 digits
Tolerance:	No errors
Values:	1 to 99

SUBSECTION 8.6.6 ADDITIONAL DIAMETER DATA ITEMS

Item 8.6.6.1 DIAMETER CHECK (CORE 5.12)
[TREE.DIACHECK_PNWRS]

Record this code to identify the accuracy of the diameter measurement due to factors such as abnormal swellings, diseases, damage, new measurement positions, etc. that may affect use of this tree in diameter growth/change analyses. Note: If both code 2 ***and*** *codes 1, 5, 6, or 7* apply, *diameter is both estimated and moved,* use code 2 *and change the PREVIOUS DIAMETER if necessary*.

If diameter is estimated because of moss/vine/obstruction, record an estimate of the diameter without the obstruction. Do not remove moss, lichens, or vines.

If diameter at the current inventory is measured at a different location than at the previous inventory, record DIAMETER CHECK = 2 and remove the d-nail(s) from the previous inventory. If the previous point diameter measurement cannot be found on a live tree (i.e., nail fell out) also record code "2".

DIAMETER CHECK = 2 should not be coded for remeasurement saplings without diameter nails or trees without nails due to monumenting restrictions (such as trees in National Parks).

Note: If either code 1 or code 2 is used, a TREE NOTE is required.

When Collected:	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC		
Field width:	1 digit		
Tolerance:	No errors		
Values:	PNW Code	Description	Core Code (office use only)
	0	Diameter measured accurately *at correct location*	0
	1	Diameter estimated*, for any reason other than moss, vines, or the double nail method*	1
	2	Diameter measured at different location than previous measurement*, no old nail found, previous diameter was obviously incorrect, and/or previous diameter has been updated. An electronic Tree Note is required to describe the situation.*	2
	5	Diameter estimated because of moss	1
	6	Diameter estimated because of vines	1
	7	Diameter estimated (double nail diameter)	1

Item 8.6.6.2 LENGTH TO DIAMETER MEASUREMENT POINT (CORE 5.24)
[TREE.HTDMP]

<u>Record this item when tree diameter measurement locations are not monumented. For those trees measured directly at 4.5 feet above the ground, leave this item blank. If the diameter is not measured at 4.5 feet, record the actual length from the ground, to the nearest 0.1 foot, at which the diameter was measured for each tally tree, 1.0 inch DBH and larger. Leave this item blank for woodland species measured for diameter at root collar</u>.

When Collected:	All live and standing dead tally trees (except woodland species) ≥ 1.0 inches DBH
Field width:	3 digits
Tolerance:	+/- 0.2 feet
Values:	00.1 – 15.0

SECTION 8.7 TREE GROWTH

SUBSECTION 8.7.1 TREE AGE

Item 8.7.1.1 TREE AGE (PFSL)
[TREE.BHAGE]

This data item is used to determine STAND AGE, and to develop regression estimators of tree growth, mortality and harvest. Douglas-fir tree cores collected by Forest Service staff for tree ring analysis support a dataset used to research regional climate disturbance patterns (see APPENDIX K, Douglas-Fir Tree Core Special Study for further instruction).

Selection: Starting from North and working in a clockwise direction on each subplot/macroplot, determine the age of one live tree representing each SPECIES, within each CROWN CLASS, for each condition class present on the plot. Although this selection method is to be used on each subplot/macroplot, only one tree in each SPECIES/CROWN CLASS/condition class needs to be aged on the entire plot. Saplings can be aged using the whorl-count procedures below, only if sufficient age data cannot be obtained on larger trees. If a sapling has been aged prior to encountering a tree ≥5.0 inches (with the same SPECIES/CROWN CLASS/condition class) on a subsequent subplot, an age must be obtained for the tree ≥5.0 inches. The PDR will identify trees to be aged using the above selection criteria.

- **Example:** Subplot 1 has a white fir, with a CROWN CLASS of “3”, in condition class 1. Over the entire plot, only one white fir in condition class 1 with a CROWN CLASS of “3” needs to be aged. This selection method is applied regardless of differences in diameter of the trees.

Do not select or use: Trees with any sign of rot present within the lower bole; trees with rot present in an increment core on which age cannot be accurately determined; or any tree with severe deformities at DBH. Bypass these trees and select the next one by SPECIES/CROWN CLASS/condition class.

Do not collect TREE AGE for Great Basin bristlecone pine (142), any woodland species, or any hardwood species except red alder.

Leave the extracted increment core at the base of the tree in a relatively protected location so it can be located, if necessary. When Douglas-fir cores are collected by CREW TYPE = 1, see Appendix K, Douglas-Fir Tree Core Special Study, for additional instructions.

Determining age for trees that have been cored previously:

Trees bored at a previous occasion will have TREE AGE updated to the current year on the PDR. Current crews are responsible for the accuracy of data when using a previously bored age and also in making sure the selection requirements listed above, are met.

In certain situations, previously collected TREE AGE should be changed, removed from the data set, or supplemented with additional age trees. These include changes in condition class or CROWN CLASS, and corrections to tree SPECIES of aged trees. In rare instances, the previous age may be a typo or an obvious error. If you find an error, re-bore the tree to collect a new age. Overwrite the existing age with the new one and change the TREE AGE METHOD to a "1" (bored at the current inventory). For those trees with suspicious ages that cannot be re-bored, delete the existing age and select another tree to satisfy the SPECIES/CROWN CLASS/condition class requirement.

1. **Remeasurement (annual to annual inventory) plots:** TREE AGE from the previous visit will be downloaded to the PDR. Field crews are required to verify the accuracy of this age and revise when necessary. Downloaded TREE AGE will have an "2" next to the age indicating that it is updated to current year. The PDR will alert the user if an additional TREE AGE is required for a given SPECIES/CROWN CLASS/condition class category whenever updated information indicates a missing category.
2. **Periodic to annual inventory plots:** TREE AGE may be obtained from measurements made during the periodic inventory and can be used to fulfill the selection requirements above (SPECIES/CROWN CLASS/condition class). Use the old plot data printouts to determine which trees were bored for age (denoted by a "+" next to the age). If the previous age seems correct, add the number of growing seasons to that age and record as the current TREE AGE.
   - Some plots were visited multiple times during the periodic inventory. These plots may have old plot data sheets which contain ages updated to the current year of that inventory (denoted by an "*" next to the age).
   - On R5 Forest Service administered lands only, the previously recorded TREE AGE includes 10 years added to DBH ages to allow for tree growth to 4.5 feet. Subtract this 10 years before adding the number of growing seasons to the current year.

Determining age for trees that have not been cored previously (use one of the following methods):

A. Core the tree with an increment borer and record the number of rings between the current year's increment and the pith. **Core a tree only if it is ≥ 5.0 inches in diameter at 4.5 feet.** Bore the tree about one inch below the point where the diameter measurement was taken (to avoid impacting the diameter measurement), on the side of the tree facing subplot center; if impossible, bore the tree on the side opposite subplot center. If neither of these locations will suffice, bore the tree just below the point of diameter measurement at any accessible location on the tree’s circumference. Extrapolate ages for trees too large to reach the pith with the borer (see instructions below).

B. Determining breast height age of large trees: Large tree size is not a valid reason for bypassing a tree for boring. To determine the age of a tree whose radius is greater than the length of the increment borer, use the following procedure. This procedure is available as a "pop-up" menu on the data recorder.

Step 1. Bore into the tree as far as possible, extract the core (do not discard the bark), and count the rings. Record this number for NUMBER OF RINGS (Item 8.7.1.3).

Step 2. Count the number of rings in the inner 2 inches of the core closest to the center of the tree. Record this number for NUMBER OF RINGS IN INNER 2 INCHES (Item 8.7.1.4).

Step 3. Measure the total length of the extracted core to the nearest 0.1 inch (include the entire thickness of bark at point of measurement, even though some of it may not be in the core because it crumbled or the tree was cored in a bark furrow). Record this length for LENGTH OF MEASURED CORE (Item 8.7.1.5).

Step 4. Divide the tree's diameter by 2 to determine the radius in inches.

Step 5. Subtract #3 (length of the extracted core) from #4 (the radius in inches). The result is the length in inches that the extracted core is short of reaching the tree center.

Step 6. Divide #5 (inches from the core to tree center) by 2 inches. The result equals the number of 2 inch lengths to the tree center.

Step 7. Multiply #6 by the number of rings in the inner 2 inches (#2) to determine the number of rings from the inner end of the extracted core to the tree center.

Step 8. Add #7 to the total number of rings in the extracted core (#1). This is the tree's estimated age at breast height (i.e., number of rings in the entire radius).

Step 9. Record an extrapolated age for TREE AGE METHOD (Item 8.7.1.2).

Example: Determine the age of a 59.6-inch western hemlock. The core has 110 rings, and has 10 rings in the inner 2 inches. 0.8 inches of the 16.4-inch-long increment borer did not penetrate the tree and 1 inch of bark within the core fell off when it was extracted from the borer, resulting in a 14.6-inch core. Each number below is associated with its corresponding step above:

Step 1. 110 rings counted

Step 2. 10 rings in the inner 2 inches of the core

Step 3. 14.6 inches of core was extracted + 1 inch of bark that fell out of the core = 15.6

Step 4. 59.6 inches is the tree's diameter, then divide by 2 = 29.8 inches to center of tree (pith)

Step 5. 29.8 inches (true center) - 15.6 inches (measured core) = 14.2 inches short of reaching pith

Step 6. 14.2 inches / 2 = 7.1 (2 inches) lengths short

Step 7. 7.1 (from step 6) x 10 (from step 2) = 71 rings not counted

Step 8. 110 rings counted (step 1) + 71 rings not counted (step 7) = 181 years old at breast height

Step 9. Record an extrapolated age for TREE AGE METHOD (Item 8.7.1.2).

C. Age of some species can be determined by counting the whorls of saplings. If no suitable tree ≥ 5.0 inches DBH is available for a given SPECIES/CROWN CLASS/condition class combination, check for the species in the microplot sapling tally, using the selection criteria below. Count whorls above the 4.5-foot mark if < 5.0 inches at DBH.

Selection: Starting from North and working in a clockwise direction on the microplot, determine the age of one live sapling representing each species for which an age could not be obtained on a tree ≥ 5.0 inches, within each CROWN CLASS, for each condition class present on the plot.

Do not record for: Suppressed trees (CROWN CLASS = 5).

Determine age by whorl count for the following species only: pines; Douglas-fir; and true firs.

When collected:	On new plots (SAMPLE KIND = 1): first live tree by species/crown class/ condition class. On remeasurement plots (SAMPLE KIND = 2), or revisited periodic plots (PNW PLOT KIND = 2 or 3): downloaded previous ages must be verified. Excludes: Great Basin bristlecone pine (142), any woodland species, or any hardwood species except red alder.	
Field width:	4 digits	
Tolerance:	Trees with bored age	+/- 10 percent
	Trees with extrapolated age	+/- 30 percent
Values:	001 to 9999	

Item 8.7.1.2 TREE AGE METHOD (PFSL)
[TREE.BORED_CD_PNWRS]

Record a code for the method used to determine TREE AGE. Trees bored or “whorl-counted” at the current inventory are assigned code "1". Ages derived from previous inventory data and updated to the current year are assigned code "2". Extrapolated ages are assigned code “3”.

When collected:	Trees bored or whorl-counted at the current inventory, downloaded for trees that were aged previously
Field width:	1 digit
Tolerance:	No errors
Values:	Code / Description
	1 — Bored or whorl-counted at the current inventory
	2 — Derived from previous inventory data and updated to the current year
	3 — Extrapolated age

Item 8.7.1.3 NUMBER OF RINGS (PFSL)
[TREE.RING_COUNT_PNWRS]

When TREE AGE is extrapolated (TREE AGE METHOD = 3), record the total NUMBER OF RINGS counted.

When collected:	When TREE AGE METHOD = 3
Field width:	3 digits
Tolerance:	+/- 10 percent
Values:	001-999

Item 8.7.1.4 NUMBER OF RINGS IN INNER 2 INCHES (PFSL)
[TREE.RING_COUNT_INNER_2INCHES_PNWRS]

When TREE AGE is extrapolated (TREE AGE METHOD = 3), record the number of rings counted in the inner 2 inches of the core closest to the center of the tree.

When collected:	When TREE AGE METHOD = 3
Field width:	2 digits
Tolerance:	+/- 10 percent
Values:	01-99

Item 8.7.1.5 LENGTH OF MEASURED CORE (PFSL)
[TREE.CORE_LENGTH_PNWRS]

When TREE AGE is extrapolated (TREE AGE METHOD = 3), measure and record the total length of the extracted core to the nearest 0.1 inch (include the entire thickness of bark at point of measurement, even though some of it may not be in the core because it crumbled or the tree was cored in a bark furrow).

When collected:	When TREE AGE METHOD = 3
Field width:	5 digits (xxx.y)
Tolerance:	+/- 0.2 inch
Values:	000.1-999.9

Item 8.7.1.6 10-YEAR INCREMENT (AFSL, PFSL)
[TREE.INC10YR_PNWRS]

This is a 3-digit code recording bored radial increment for all conifer species and red alder. Measurement is taken to the nearest 1/20th inch, for a 10-year period. 10-YEAR INCREMENT is recorded for every tree cored for TREE AGE with an increment borer at the current inventory.

Do not collect for trees bored for age at the previous annual visit (when SAMPLE KIND = 2).

To obtain a radial increment:

Step 1. Use the same core extracted to determine TREE AGE. Count back 10 growth rings from the cambium end of the core starting from the first fully-formed ring (and skipping this year's summer growth). See diagram below:

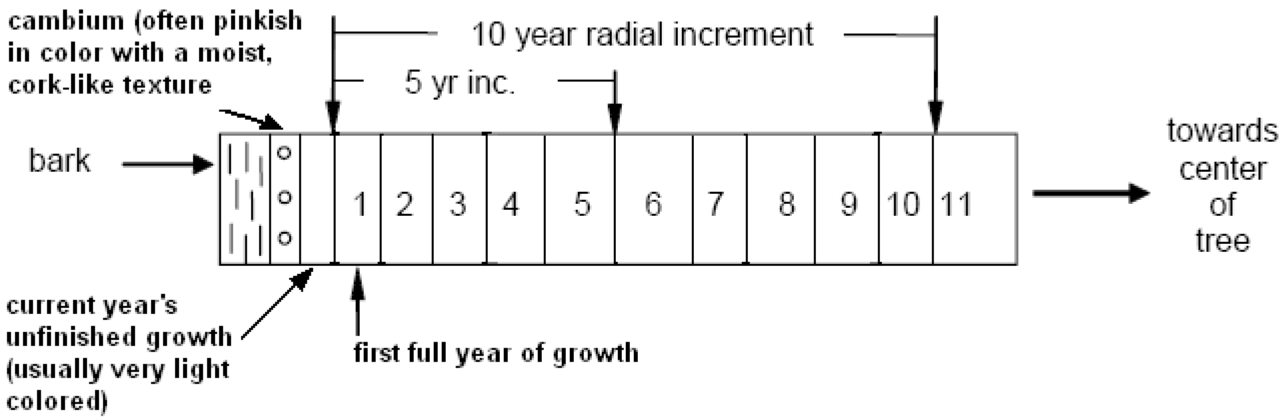


Figure 8.42: Bored tree core showing where to measure 5- and 10-year radial increments.

Step 2. Measure the length of this segment of the core to the nearest 1/20th inch to get radial increment. Enter this radial increment as the number of twentieths, e.g., 18/20 is recorded "18" and 27/20 is recorded "27".

When collected:	When TREE AGE ≥ 10 and TREE AGE METHOD = 1 or 3: all conifer and red alder trees bored for TREE AGE with an increment borer at the current visit
Field width:	3 digits
Tolerance:	1/20th per 1 inch of increment
Values:	001 to 999

Item 8.7.1.7 5-YEAR INCREMENT (PFSL)
[TREE.INC5YR_PNWRS]

A 3-digit code recording bored radial increment for all conifer species and red alder. Measurement is taken to the nearest 1/20th inch, for a 5-year period. 5-YEAR INCREMENT is recorded for every tree cored for TREE AGE with an increment borer at the current inventory. The procedures for the 5-YEAR INCREMENT are the same as for the 10-YEAR INCREMENT, except the increment period is five years.

Do not collect for trees bored for age at the previous annual visit (when SAMPLE KIND = 2).

When collected:	When TREE AGE METHOD = 1 or 3: all conifer and red alder trees bored for TREE AGE with an increment borer at the current visit
Field width:	3 digits
Tolerance:	1/20th per 1 inch of increment
Values:	001 to 999

Item 8.7.1.8 5-YEAR HEIGHT GROWTH (PFSL)
[TREE.INC5YRHT_PNWRS]

For R5 and R6 Forest Service administered lands, and Western Oregon BLM timberland inventory only: This data item is specific to growth and yield models used by R5, R6, and BLM. Record a 5-YEAR HEIGHT GROWTH on saplings (trees ≥ 1.0 inch and < 5.0 inches DBH). Begin at the sixth branch whorl from the top of the tree and measure to the first branch whorl from the top. Do not count false whorls or the current year's growth. Measure to the nearest 0.1 foot, always rounding down.

Record 5-YEAR HEIGHT GROWTH for the following species only: Pine; spruce; Douglas-fir; and true fir (i.e., all species within the genera Pinus, Abies, Picea, and Pseudotsuga). Note: although whorl-counted ages are not obtained for spruce, 5-year height growth is recorded for spruce.

Do not record for woodland species or hardwoods. If unable to accurately determine whorls due to crown class or suppression, record an electronic PLOT NOTE.

<u>New installations</u> (SAMPLE KIND = 1): Starting from North and working in a clockwise direction on each microplot, record a 5-YEAR HEIGHT GROWTH measurement for at least the first sapling representing each SPECIES, in each CROWN CLASS, for each condition class present on the plot.

- Although this selection method is to be used on each microplot, only one tree in each SPECIES/ CROWN CLASS/condition class needs a growth measurement on the entire plot.

Remeasurement plots (SAMPLE KIND = 2): Record this measurement for ingrowth (saplings that are now ≥ 1.0 inch and < 5.0 inches) since the previous inventory, regardless of SPECIES/CROWN CLASS/condition class.

<table>
<tr><td>When collected:</td><td colspan="2">On new installations (ADMINISTRATIVE FOREST CODE = 501 - 699 or OWNER CLASS = 22 and BLM RESOURCE AREA = not null, and SAMPLE KIND = 1): one live sapling (≥ 1.0 inch and < 5.0 inches DBH) per species/crown class/condition class on microplot.
On remeasurement plots (ADMINISTRATIVE FOREST CODE = 501 - 699 or OWNER CLASS = 22 and BLM RESOURCE AREA = not null, and SAMPLE KIND = 2): any sapling ingrowth (saplings that are now ≥ 1.0 inch and < 5.0 inches) on the microplot since the previous inventory, regardless of species/crown class/condition class.</td></tr>
<tr><td>Field width:</td><td colspan="2">4 digits (xx.y)</td></tr>
<tr><td rowspan="5">Tolerance:</td><td colspan="2">The tolerance depends on the height of the tree:</td></tr>
<tr><td>< 15 feet</td><td>+/- 0.5 feet</td></tr>
<tr><td>15 – 35 feet</td><td>+/- 1.0 feet</td></tr>
<tr><td>36 – 50 feet</td><td>+/- 2.0 feet</td></tr>
<tr><td>≥ 50 feet</td><td>+/- 3.0 feet</td></tr>
<tr><td>Values:</td><td colspan="2">0.1 to 25.0</td></tr>
</table>

SUBSECTION 8.7.2 TREE LENGTH

Item 8.7.2.1 GROWTH SAMPLE TREE (PFSL, AFSL)
[TREE.GST_PNWRS]

Code that identifies whether the tree is to be measured for TOTAL LENGTH and ACTUAL LENGTH. In the order of tally on the subplot (starting from north on each subplot) the first live tree of a species encountered in each DBH group and condition class will be identified as a growth sample tree. Growth sample trees are systematically identified by the data recorder even if the tree is damaged or unhealthy; trees with unbroken tops are selected preferentially. The data recorder determines GST status when DIA is entered. If a tree initially identified as GST=Y is measured with a broken top (TOTAL LENGTH not equal to ACTUAL LENGTH), the next potential GST tree in the tree list will be identified as GST=Y. Update the GROWTH SAMPLE TREE code from N to Y for any tree with an observed missing or broken top (i.e., Damage Agent 1, 2, or 3 = 90001), or saplings with broken tops. All standing dead trees will automatically be coded as GST = Y.

DBH groups
1.0 to 4.9 inches
5.0 to 9.9 inches
10.0 to 14.9 inches
15.0 to 19.9 inches
20.0 to 24.9 inches
25.0 to 29.9 inches
30.0 to 39.9 inches
>=40.0 inches

<table>
<tr><td>When collected:</td><td colspan="2">When SAMPLE KIND = 2 and PRESENT TREE STATUS = 1 or (PRESENT TREE STATUS = 2 and STANDING DEAD = 1)</td></tr>
<tr><td>Field width:</td><td colspan="2">1 digit</td></tr>
<tr><td>Tolerance:</td><td colspan="2">No errors 90% of the time</td></tr>
<tr><td rowspan="3">Values:</td><td>Code</td><td>Description</td></tr>
<tr><td>N</td><td>Tree is not a growth sample tree</td></tr>
<tr><td>Y</td><td>Tree is a growth sample tree</td></tr>
</table>

Table 8.6: Species that are always measured for TOTAL LENGTH and ACTUAL LENGTH (GST = Y)

Species	Common Name	CODE
52	Baker or Modoc cypress	CUBA
55	Sargent's cypress	CUSA3
66	Rocky Mountain juniper	JUSC2
92	Brewer spruce	PIBR
104	foxtail pine	PIBA
109	Coulter pine	PICO3
113	limber pine	PIFL2
120	bishop pine	PIMU
124	Monterey pine	PIRA2
130	Scotch pine	PISY
137	Washoe pine	PIWA
142	Great Basin bristlecone pine	PILO
201	bigcone Douglas-fir	PSMA
212	giant sequoia	SEGI2
251	California torreya (nutmeg)	TOCA
313	boxelder	ACNE2
320	Norway maple	ACPL
330	buckeye, horsechestnut spp.	AESCU
341	ailanthus	AIAL
374	water birch	BEOC2
511	Tasmanian bluegum	EUGL
603	northern California black walnut	JUHI
604	southern California black walnut	JUCA
611	sweetgum	LIST2
730	California sycamore	PLRA
748	Fremont cottonwood	POFR2
756	honey mesquite	PRGL2
758	screwbean mesquite	PRPU
771	sweet cherry, domesticated	PRAV
811	Engelmann oak	QUEN
826	chinkapin oak	QUMU
901	black locust	ROPS
922	black willow	SANI
926	balsam willow	SAPY
927	white willow	SAAL2
990	desert ironwood	OLTE
997	Russian-olive	ELAN

Item 8.7.2.2 PREVIOUS ACTUAL LENGTH (PNW)
[TREE.PREV_ACTUALHT_PNWRS]

This is the actual tree length measured by the field crew during the previous annual visit. It has been downloaded from the annual inventory and will be editable by the current field crew for dead trees and all live trees with GROWTH SAMPLE TREE = Y. These data are provided to help ensure quality of tree length data through comparison of the previous length versus the currently measured length, and to assist in estimation of current tree length, if estimation is necessary due to lean, dead top, etc.

Editing or otherwise overwriting the PREVIOUS ACTUAL LENGTH is restricted to the following scenarios:

1. Obvious error: Correct PREVIOUS ACTUAL LENGTH if error appears to be greater than twenty percent of the PREVIOUS ACTUAL LENGTH.
2. Data entry error: Correct PREVIOUS ACTUAL LENGTH if error is diagnosable as a typographical error.

Any change made to this field signifies an error at the time of the previous inventory.

When collected:	When SAMPLE KIND = 2: all downloaded live tally trees ≥ 1.0 inch DBH/DRC when GROWTH SAMPLE TREE = Y; and standing dead tally trees ≥ 1.0 inch DBH/DRC with a measured (not estimated) ACTUAL LENGTH at the previous inventory
Field width:	3 digits
Tolerance:	+/- 10 percent
Values:	001 to 400

Item 8.7.2.3 ACTUAL LENGTH (CORE 5.15)
[TREE.ACTUALHT]

For all live trees with GROWTH SAMPLE TREE = Y and all dead trees, the ACTUAL LENGTH of the tree is recorded from ground level (measured from the uphill side of a tree on a slope) to the highest remaining portion of the tree still present and attached to the bole. For trees with missing tops (top on live trees is completely detached; top on dead trees is greater than 50 percent detached from the bole, as demonstrated by greater than 50 percent of the bole's circumference (shell) no longer being continuously intact).. On live or dead trees, do not include shards that may remain above a broken or missing bole. record the ACTUAL LENGTH of the tree to the nearest 1.0 foot from ground level to the break. Use the length to the break for ACTUAL LENGTH until a new leader qualifies as the new top for TOTAL LENGTH; until that occurs, continue to record ACTUAL LENGTH to the break. Trees with previously broken tops are considered recovered (i.e., ACTUAL LENGTH = TOTAL LENGTH) when a new leader is 1/3 the diameter of the broken top at the point where the top was broken (not where the new leader originates from the trunk). Account for lean (see Figure 8.43: Measuring height of leaning tree), but do not add length for crooks and sweeps.

ACTUAL LENGTH should only differ from TOTAL LENGTH if the tree has a broken or missing top.

When Collected:	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC *when GROWTH SAMPLE TREE = Y or null*
Field width:	3 digits
Tolerance:	+/- 5 percent of true length for live trees < 60 feet
	+/- 10 percent of true length for live trees ≥ 60 feet and all dead trees
Values:	*001* to 400

Item 8.7.2.4 PREVIOUS TOTAL LENGTH (PNW)
[TREE.PREV_HT_PNWRS]

This is the total tree length recorded by the field crew during the previous annual visit. It has been downloaded from the annual inventory and will be editable by the current field crew for dead trees and live trees with GROWTH SAMPLE TREE = Y. These data are provided to help ensure quality of tree length data through comparison of the PREVIOUS TOTAL LENGTH to the currently measured TOTAL LENGTH, and to assist in estimation of current tree length, if estimation is necessary due to lean, dead top, etc.

Editing or otherwise overwriting the PREVIOUS TOTAL LENGTH is restricted to the following scenarios:

1. Obvious error: Correct PREVIOUS TOTAL LENGTH if error appears to be greater than twenty percent of PREVIOUS TOTAL LENGTH.
2. Data entry error: Correct PREVIOUS TOTAL LENGTH if error is diagnosable as a typographical error.

Any change made to this field signifies an error at the time of the previous inventory.

When collected:	When SAMPLE KIND = 2: all downloaded live tally trees ≥ 1.0 inch DBH/DRC when GROWTH SAMPLE TREE = Y; and standing dead tally trees ≥ 1.0 inch DBH/DRC with a recorded TOTAL LENGTH at the previous inventory
Field width:	3 digits
Tolerance:	+/- 10 percent
Values:	001 to 400

Item 8.7.2.5 TOTAL LENGTH (CORE 5.14)
[TREE.HT]

For all live trees with GROWTH SAMPLE TREE = Y and all dead trees, record the TOTAL LENGTH of the bole, to the nearest 1.0 foot from ground level up past the 4-inch top to the tip of the apical meristem. For trees growing on a slope, measure on the uphill side of the tree. If the tree has a missing top (top is broken and completely detached from the tree), estimate what the total length would be if there were no missing top. TOTAL LENGTH on multi-stemmed woodland species is based on the length of the longest stem present. Account for lean (see Figure 8.43), but do not add length for crooks and sweeps.

Height on leaning trees: Measure or estimate total normally-formed bole length (from the base to the tip of the tree), and not the perpendicular from the ground to the tip. To measure heights of leaning trees using a clinometer, follow these steps:

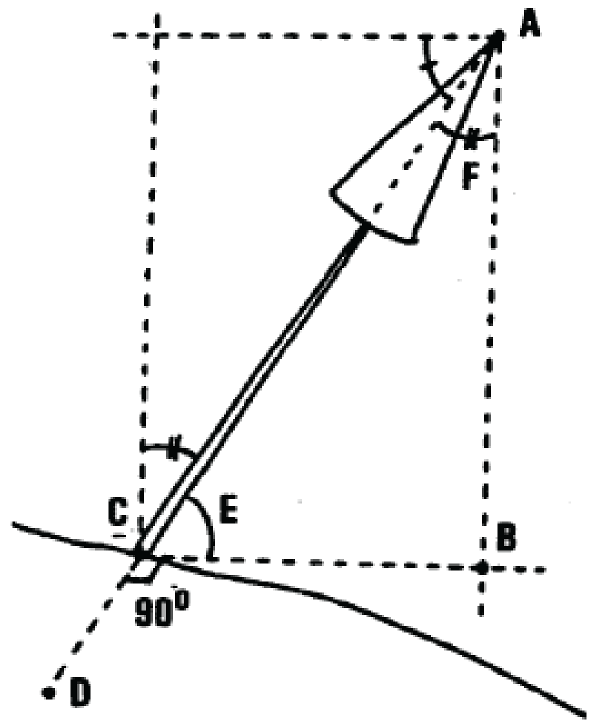


Figure 8.43: Measuring height of leaning tree

Step 1. Move to a point along a line (point D) that is perpendicular to the plane in which the tree is leaning.

Step 2. Using a clinometer, measure the height of point A above point B.

Step 3. By standing at the base of the tree and sighting up the bole with your clinometer, measure the slope of the bole in degrees (Angle E in the diagram above).

Step 4. Subtract the degrees of lean (step 3) from 90 degrees. This gives you the degrees of angle F.

Step 5. By sighting through your clinometer, convert the angle calculated in step 4 to a percentage.

Step 6. Use the slope correction table in Appendix B to determine the expansion factor for the percent slope determined in step 5. Multiply the expansion factor by the measured distance from point A to point B (step 2). This gives the length of the bole (point A to point C).

When Collected:	All live and dead tally trees ≥ 1.0 inch DBH/DRC*when GROWTH SAMPLE TREE = Y or null*
Field width:	3 digits
Tolerance:	+/- 10 percent of true length
Values:	*001* to 400

Item 8.7.2.6 LENGTH METHOD (CORE 5.16)
[TREE.HTCD]

Record the code that indicates the method used to determine tree length.

When Collected:	All live and standing dead tally trees ≥ 1.0 inch DBH*/DRCwhen GROWTH SAMPLE TREE = Y*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Total and actual lengths are field measured with a measurement instrument (e.g., clinometer, relascope, tape, *laser*)
	2	Total length is visually estimated, actual length is measured with an instrument
	3	Total and actual lengths are visually estimated *(not measured)*

Item 8.7.2.7 PREVIOUS LENGTH METHOD (PNW)
[TREE.PREV_HTCD_PNWRS]

Downloaded code indicating the method used to determine tree length at the previous visit. This field cannot be updated by the field crew.

When Collected:	All live tally trees ≥ 1.0 inch DBH/DRC and all standing dead tally trees ≥ 1.0 inches DBH/DRC recorded at the previous inventory	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Total and actual lengths are field measured with a measurement instrument (e.g., clinometer, relascope, tape, laser)
	2	Total length is visually estimated, actual length is measured with an instrument
	3	Total and actual lengths are visually estimated (not measured)

SUBSECTION 8.7.3 TREE LIVE CROWN MEASUREMENTS

Item 8.7.3.1 COMPACTED CROWN RATIO (CORE 5.19)
[TREE.CR]

Record the COMPACTED CROWN RATIO for each live tally tree, 1.0 inch and larger, to the nearest one percent. COMPACTED CROWN RATIO is that portion of the tree supporting live foliage (or in the case of extreme defoliation should be supporting live foliage) and is expressed as a percentage of the ACTUAL TREE LENGTH *(include dead tops but not missing tops in the ratio)*. To determine COMPACTED CROWN RATIO, ocularly transfer lower live branches to fill in large holes in the upper portion of the tree until a full, even crown is visualized. On trees with an unrecovered broken top, do not include any foliage that extends above the actual break regardless of where it originates (Figure 8.44).

Do not over-compact trees beyond their typical full crown *structure*. For example, if tree branches tend to average 2 feet between whorls, do not compact crowns any tighter than the 2-foot spacing (Figure 8.45). Include epicormic branches with a 1-inch diameter or greater.

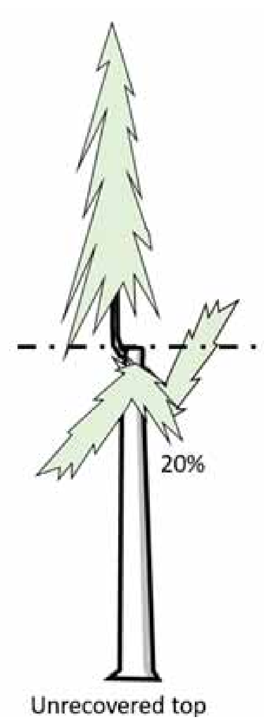


Figure 8.44: ACTUAL LENGTH is measured up to the dashed line at the break and no foliage above that point is considered when calculating the COMPACTED CROWN RATIO, which is estimated to be 20% in this example.

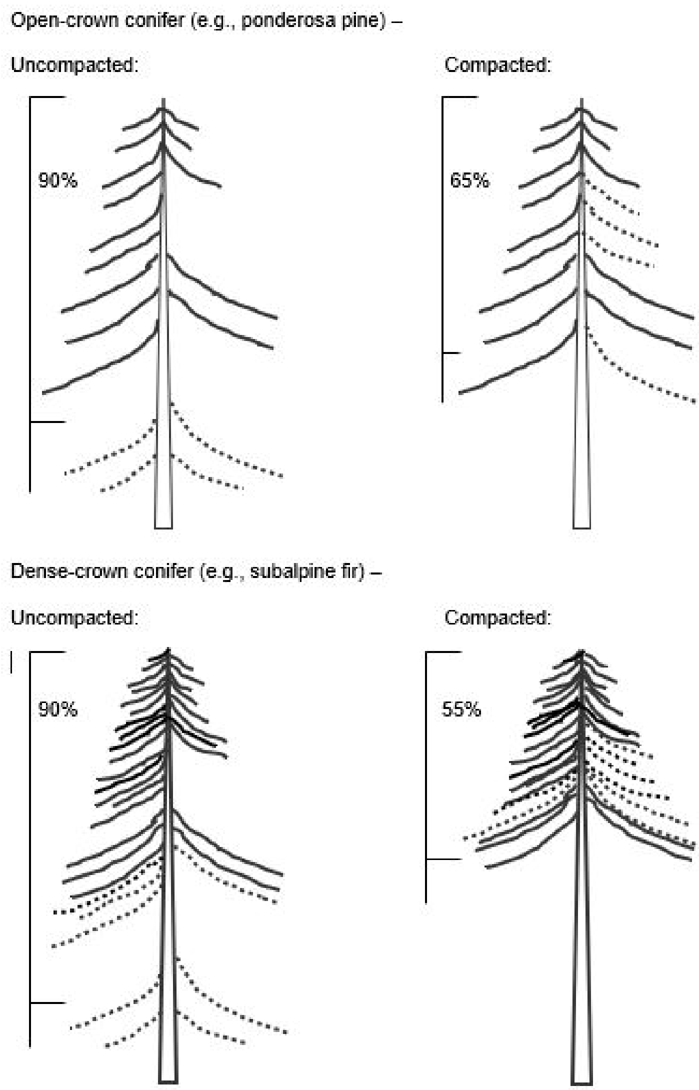


Figure 8.45: Examples of COMPACTED CROWN RATIO

Note: Crown ratio is based on the ratio of foliage, not where the limbs attach to the tree bole.

For multi-stemmed woodland species, ocularly transfer lower live foliage to fill large holes on all stems and form an even crown across the tree.

Crown ratio is an indicator of a tree's vigor. In data analysis, trees with a crown ratio of 30 percent or less are considered less vigorous. For this reason, **be particularly careful when deciding between codes greater or less than "30".** It is preferable to use a laser or clinometer to measure live crown ratios on these trees. When GROWTH SAMPLE TREE = N, the COMPACTED CROWN RATIO from the previous visit will be downloaded. Update this value if there is an obvious error or change.

When Collected:	All live tally trees ≥ 1.0 inch DBH/DRC
Field width:	2 digits
Tolerance:	+/- 10 percent
Values:	00 to 99

Item 8.7.3.2 CROWN CLASS (CORE 5.17)
[TREE.CCLCD]

Rate tree crowns in relation to the **sunlight received** and proximity to neighboring trees (Figure 8.46). Base the assessment on the position of the crown at the time of observation. Example: a formerly overtopped tree that is now dominant due to tree removal is classified as dominant. Crown classifications are easily applied in even-aged stands. Classifications are more difficult to assign in uneven-aged stands or in plots where more than one age class is present. In these situations, classify the tree based on its immediate environment. In other words, base your classification on how much light the tree's crown is receiving, not its position in the canopy. This data item is used to predict tree growth. The intermediate and overtopped crown classes are meant to include trees seriously affected by direct competition with adjacent trees.

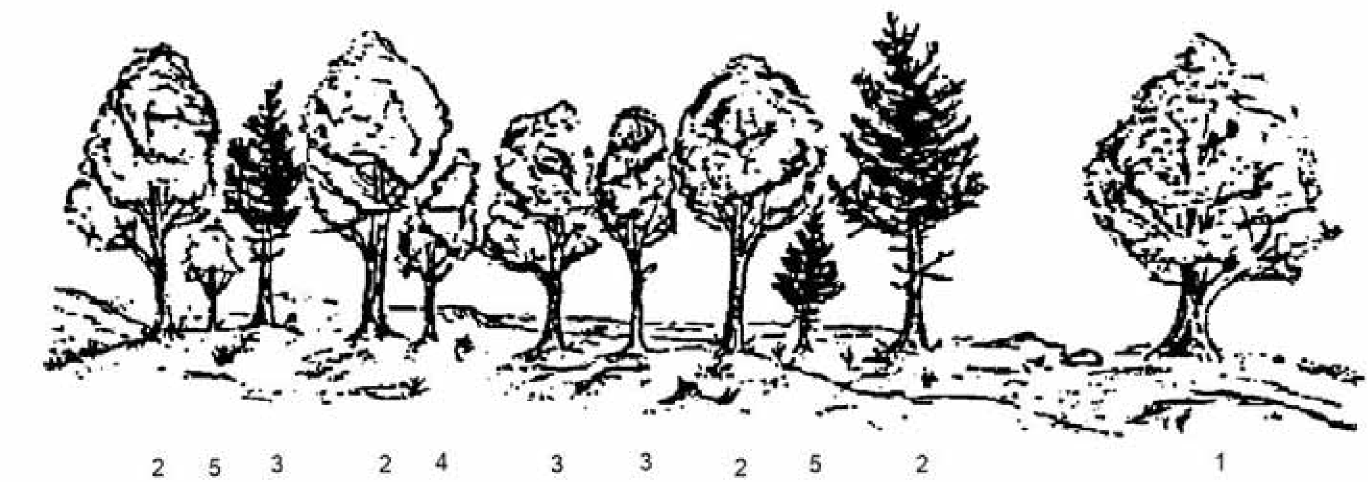


Figure 8.46: Examples of CROWN CLASS by code definitions (numbers are CROWN CLASS codes)

Crown class describes a tree's "social" position in the stand and may indicate how well the tree is competing for light.

For example, a young, vigorous tree that is considerably shorter than other trees in the stand – but that is not overtopped by other trees and that receives full light from above and partly from the side – is classified as dominant. The same principle applies to two-storied stands: understory trees should only be assigned subordinate crown classes if they are adjacent to overtopping trees. In plots with scattered residual overstory trees over younger trees, a considerable portion of the understory trees will be classified as dominant or codominant.

When GROWTH SAMPLE TREE = N, the CROWN CLASS from the previous visit will be downloaded. Update this value if there is an obvious error or change.

When Collected:	All live tally trees ≥1.0 inch DBH/DRC	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	1	Open Grown – trees with crowns that received full light from above and from all sides throughout most of its life, particularly during its early developmental period.
	2	Dominant – trees with crown extending above the general level of the crown canopy and receiving full light from above and partly from the sides. These trees are taller than the average trees in the stand and their crowns are well developed, but they could be somewhat crowded on the sides. Also, trees whose crowns have received full light from above and from all sides during early development and most of their life. Their crown form or shape appears to be free of influence from neighboring trees.
	3	Co-dominant – trees with crowns at the general level of the crown canopy. Crowns receive full light from above but little direct sunlight penetrates their sides. Usually they have medium-sized crowns and are somewhat crowded from the sides. In stagnated stands, co-dominant trees have small-sized crowns and are crowded on the sides.

	4	Intermediate – trees that are shorter than dominants and co-dominant, but their crowns extend into the canopy of co-dominant and dominant trees. They receive little direct light from above and none from the sides. As a result, intermediate trees usually have small crowns and are very crowded from the sides.
	5	Overtopped – trees with crowns entirely below the general level of the crown canopy that receive no direct sunlight either from above or the sides.

SECTION 8.8 TREE DAMAGE

Damage is a composite variable. Up to three damaging agents may be recorded per tree. Many damaging agents are host specific and their potential for damage could vary by region. In general, a recorded damage is likely to:

1. Prevent the tree from surviving more than 1-2 years
2. Reduce the growth of the tree in the near term
3. Negatively affect a tree's marketable products (cubic, BF, or other)

It is not necessary to record damage agents in order of their severity unless there are more than three agents. If there are more than three agents, record only the most important ones using the list of impacts above as a guide (i.e., agents threatening survival are more important than agents that reduce wood quality). In general, agents that affect the roots or bole tend to be most threatening, because they have the capacity to affect the entire tree; damage to peripheral parts of the tree may be temporary because leaves, shoots, and reproductive structures may be replaced.

Codes used for this variable come from a January 2012 Pest Trend Impact Plot System (PTIPS) list from the Forest Health Technology Enterprise Team (FHTET) that has been modified to meet FIA needs. This list is made up of General Agents and then further subdivided into specific agents. Not every General Agent PTIPS code will be available for use for this variable; some do not cause tree damage as defined above while others are better recorded in a different General Agent. Not every specific agent PTIPS code will be available for use for this variable. Regions will decide which specific agents they will identify in their areas.

Record the general agent unless the Region opts to collect specific agents. Specific agents can later be collapsed into the general agent categories for cross-region comparisons. In the unusual instance when more than one specific agent in the same general category occurs on the same tree, record them both. If a specific agent is identified on that plot but that agent is not on the regionally recognized list of codes for damage agents, use its General Agent code. Appendix G contains the regionally recognized list of codes for damage agent based on the modified PTIPS list from FHTET. Only the specific agent codes from Appendix G may be used instead of the general codes listed under DAMAGE AGENT 1. Any damage code in Appendix G may be used for DAMAGE AGENT 1, DAMAGE AGENT 2, or DAMAGE AGENT 3.

If DAMAGE AGENT code 21028 is used, and leaf spots are observed on known hosts in the vicinity, collect a SOD leaf spot sample as described in Subsection 4.3.6, Sudden Oak Death Sample Collection, if possible.

Item 8.8.0.1 DAMAGE AGENT 1 (CORE 5.20.1) [TREE.DAMAGE_AGENT_CD1]

Inspect the tree from bottom to top - roots, bole, branches, foliage (including buds and shoots). Record the first damage agent observed from the list of agents (unless you observe more than 3 damages). If there are more than three agents, record only the most important ones using the list of impacts listed in Section 8.8 as a guide (i.e., agents threatening survival are more important than agents that reduce wood quality). The general agent codes, damage thresholds, and general agent descriptions are listed here. Specific agents within the general categories, if required by your Region, are listed in Appendix G, along with their associated thresholds. These codes can be collapsed into the national core general codes. Note: in some cases, thresholds for specific agents may be different from the threshold for the corresponding general agent. If a region is collecting a specific insect agent and no one is collecting the general agent, then the specific insect agent is collapsed into the general insect category 10000.

If you can accurately identify a specific damage agent that is not collected in your region, code the general agent but put the specific name and code in a note.

When collected:	All live tally trees ≥ 1.0 in DBH/DRC
Field width:	5 digits
Tolerance:	No errors
Values:	General Agent Damage Codes, Damage Thresholds, and Descriptions. Specific agent codes are in Appendix G.

CODE	GENERAL AGENT	DAMAGE THRESHOLD*	DESCRIPTIONS
0		No damage	
10000	General insects	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Insect damage that cannot be placed in any of the following insect categories.
11000	Bark beetles	Any evidence of a successful attack (successful attacks generally exhibit boring dust, many pitch tubes and/or fading crowns).	Bark beetles (*Dendroctonus*, *Ips*, and other genera) are phloem-feeding insects that bore through the bark and create extensive galleries between the bark and the wood. Symptoms of beetle damage include fading or discolored tree crown (yellow or red), pitch tubes or pitch streaks on the bark, extensive egg galleries in the phloem, boring dust in the bark crevices or at the base of the tree. Bark chipping by woodpeckers may be conspicuous. They inflict damage or destroy all parts of trees at all stages of growth by boring in the bark, inner bark, and phloem. Visible signs of attack include pitch tubes or large pitch masses on the tree, dust and frass on the bark and ground, and resin streaming. Internal tunneling has various patterns. Most have tunnels of uniform width with smaller galleries of variable width radiating from them. Galleries may or may not be packed with fine boring dust.
12000	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	These are foliage-feeding insects that may reduce growth and weaken the tree causing it to be more susceptible to other damaging agents. General symptoms of defoliation damage include large amounts of missing foliage, browning foliage, extensive branch mortality, or dead tree tops.
14000	Sucking insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	Adelgids, scales and aphids feed on all parts of the tree. Often they cause galling on branches and trunks. Some appear benign but enable fungi to invade where they otherwise could not (e.g., beech bark disease). The most important ones become conspicuous because of the mass of white, cottony wax that conceals eggs and young nymphs.
15000	Boring insects	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches.	Most wood boring insects attack only severely declining and dead trees. Certain wood boring insects cause significant damage to trees, especially the exotic Asian longhorn beetle, emerald ash borer, and Sirex wood wasp. Bark beetles have both larval and adult galleries in the phloem and adjacent surface of the wood. Wood borers have galleries caused only by larval feeding. Some, such as the genus *Agrilus* (including the emerald ash borer) have galleries only in the phloem and surface of the wood. Other wood borers, such as Asian longhorn beetle bore directly into the phloem and wood. Sirex adults oviposit their eggs through the bark, and developing larvae bore directly into the wood of pines.

19000	General diseases	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	Diseases that cannot be placed in any of the following disease categories.
21000	Root/butt diseases	Any occurrence.	Root disease kills all or a portion of a tree's roots. Quite often, the pathogenic fungus girdles the tree at the root collar. Tree damage includes mortality (often occurring in groups or "centers"), reduced tree growth, and increased susceptibility to other agents (especially bark beetles). General symptoms include resin at the root collar, thin, chlorotic (faded) foliage, and decay of roots. A rot is a wood decay caused by fungi. Rots are characterized by a progression of symptoms in the affected wood. First, the wood stains and discolors, then it begins to lose its structural strength, and finally the wood starts to break down, forming cavities in the stem. Even early stages of wood decay can cause cull due to losses in wood strength and staining of the wood. Rot can lead to mortality, cull, an increased susceptibility to other agents (such as insects), wind throw, and stem breakage.
22000	Cankers (non-rust)	Any occurrence.	A canker -- a sunken lesion on the stem caused by the death of cambium -- may cause tree breakage or kill the portion of the tree above the canker. Cankers may be caused by various agents but are most often caused by fungi. A necrotic lesion begins in the bark of branches, trunk or roots, and progresses inward killing the cambium and underlying cells. The causal agent may or may not penetrate the wood. This results in areas of dead tissue that become deeper and wider. There are two types of cankers, annual and perennial. Annual cankers enlarge only once and do so within an interval briefer than the growth cycle of the tree, usually less than one year. Little or no callus is associated with annual cankers, and they may be difficult to distinguish from mechanical injuries. Perennial cankers are usually the more serious of the two, and grow from year to year with callus forming each year on the canker margin, often resulting in a target shape. The most serious non-rust cankers occur on hardwoods, although branch mortality often occurs on conifers.
22500	Stem decays	Any visual evidence (conks; fruiting bodies; rotten wood), *but do not include decay found only as a result of coring the tree.*	Rot occurring in the bole/stems of trees above the roots and stump.
23000	Parasitic / Epiphytic plants	Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes and vines covering ≥ 50% of crown.	Parasitic and epiphytic plants can cause damage to trees in a variety of ways. The most serious ones are dwarf mistletoes, which reduce growth and can cause severe deformities. Vines may damage trees by strangulation, shading, or physical damage. Benign epiphytes, such as lichens or mosses, are not considered damaging agents.
24000	Decline Complexes/ Dieback/Wilts	Damage ≥ 20% dieback of crown area.	Tree disease which results not from a single causal agent but from an interacting set of factors. Terms that denote the symptom syndrome, such as dieback and wilt, are commonly used to identify these diseases.
25000	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Foliage diseases are caused by fungi and result in needle shed, growth loss, and, potentially, tree mortality. This category includes needle casts, blights, and needle rusts.

26000	Stem rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	A stem rust is a disease caused by fungi that kill or deform all or a portion of the stem or branches of a tree. Stem rusts are obligate parasites and host specialization is very common. They infect and develop on fast-growing tissues and cause accelerated growth of infected tissues resulting in galls or cankers. Heavy resinosis is usually associated with infections. Sometimes yellow or reddish-orange spores are present giving a “rusty” appearance. Damage occurs when the disease attacks the cambium of the host, girdling and eventually killing the stem above the attack. Symptoms of rusts include galls (an abnormal and pronounced swelling or deformation of plant tissue that forms on branches or stems) and cankers (a sunken lesion on the stem caused by death of the cambium which often results in the death of tree tops and branches).
27000	Broom rusts	≥50% of crown area affected.	Broom rust is a disease caused by fungi that kill or deform all or a portion of the branches of a tree. Broom rusts are obligate parasites and host specialization is very common. They infect and develop on fast-growing tissues and cause accelerated growth of infected tissues resulting in galls. Symptoms of rusts include galls, an abnormal and pronounced swelling or deformation of plant tissue that forms on branches or stems.
30000	Fire	Damage ≥ 20% of bole circumference; >20% of stems on multi-stemmed woodland species affected; ≥20% of crown affected	Fire damage may be temporary, such as scorched foliage, or may be permanent, such as in cases where cambium is killed around some portion of the bole. The location and amount of fire damage will determine how the damage may affect the growth and survival of the tree. Fire often causes physiological stress, which may predispose the tree to attack by insects of other damaging agents.
41000	Wild animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	Wild animals from birds to large mammals cause open wounds. Some common types of damage include: sapsucker bird peck, deer rub, bear clawing, porcupine feeding, and beaver gnawing.
42000	Domestic animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	Open wounds caused by cattle and horses occur on the roots and lower trunk. Soil compaction from the long term presence of these animals in a woodlot can also cause indirect damage.
50000	Abiotic	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	Abiotic damages are those that are not caused by other organisms. In some cases, the type and severity of damage may be similar for different types of agents (e.g., broken branches from wind, snow, or ice).
60000	Competition	Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC).	Suppression of overtopped shade intolerant species. Trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC).

70000	Human activities	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	People can injure trees in a variety of ways, from poor pruning, to vandalism, to logging injury. Signs include open wounds or foreign embedded objects.
71000	Harvest	Removal of ≥10% of cubic volume	Only recorded for woodland species trees that have partial cutting
90000	Other damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	
99000	Unknown damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected.	Use this code only when observed damage cannot be attributed to a general or specific agent.

***** Some Regional specific damage agents within a category may have differing damage thresholds.

Item 8.8.0.2 DAMAGE AGENT 2 (CORE 5.20.2)
[TREE.DAMAGE_AGENT_CD2]

<u>Follow procedures described for DAMAGE AGENT 1.</u>

When collected:	All live tally trees ≥ 1.0 in DBH/DRC
Field width:	5 digits
Tolerance:	*No errors*
Values:	See Item 8.8.0.1

Item 8.8.0.3 DAMAGE AGENT 3 (CORE 5.20.3)
[TREE.DAMAGE_AGENT_CD3]

<u>Follow procedures described for DAMAGE AGENT 1.</u>

When collected:	All live tally trees ≥ 1.0 in DBH/DRC
Field width:	5 digits
Tolerance:	*No errors*
Values:	See Item 8.8.0.1

Item 8.8.0.4 DWARF MISTLETOE CLASS (CORE OPTIONAL 5.26)
[TREE.MIST_CL_CD]

<u>Rate all live conifer species, except juniper *and incense cedar*, ≥ 1.0 inch diameter for dwarf mistletoe (*Arceuthobium spp.*) infection. Use the Hawksworth six-class rating system: divide the live crown into thirds, and rate each third using the following scale (Figure 8.47). Sum the three individual ratings to obtain a total mistletoe class (0 to 6) for the tree</u>. An infection on just the bole within a third is considered light and that third should receive a rating of 1.

Code	Mistletoe	Description
0	No visible infection	None
1	Light infection	< 50 percent of the total branches infected
2	Heavy infection	≥ 50 percent of the total branches infected

Example: A conifer tree has light infection in top third of crown, no infection in the middle third, and has many brooms in the lower third.

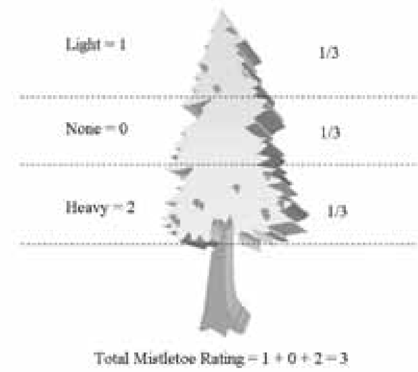


Figure 8.47: Example of the Hawksworth six-class rating system

When GROWTH SAMPLE TREE = N, the DWARF MISTLETOE CLASS rating from the previous visit will be downloaded. Update this value if there is an obvious error or change.

When collected:	All live conifer (except juniper *and incense cedar*) tally trees ≥ 1.0 inch DBH/DRC
Field width:	1 digit
Tolerance:	+/- 1 class
Values:	0 to 6

Item 8.8.0.5 ROTTEN/MISSING CULL (CORE 5.13)
[TREE.CULL_FLD]

Record the percentage of rotten or missing cubic-foot cull for all live tally trees ≥ 5.0 inches DBH/DRC and *missing cubic-foot cull on* all standing dead tally trees ≥ 5.0 inches DBH/DRC. Record the percentage of rotten and missing cubic-foot volume, to the nearest 1 percent.

When estimating volume loss (tree cull), only consider the cull on the merchantable bole of the tree, from a 1-foot stump to a 4-inch DOB *(diameter outside bark)* top. Do not include any cull estimate above ACTUAL LENGTH. For woodland species, the merchantable portion is between the point of DRC measurement to a 1.5-inch DOB top.

Rotten and missing volume loss is often difficult to estimate. Refer to supplemental disease and insect pests field guides and local defect guidelines as an aid in identifying damaging agents and their impact on volume loss. Do not include decay found only as a result of coring the tree. Be alert to such defect indicators as the following:

- Cankers or fruiting bodies
- Swollen or punky knots
- Dull, hollow sound of bole (use regional standards)
- Large dead limbs, especially those with frayed ends
- Sawdust around the base of the tree

Note the following procedures relating to the bole:

- All variables relating to merchantability are evaluated on the bole.
- Regional TREE CLASS protocols are evaluated on the bole.
- Regional TREE GRADE protocols are evaluated on the bole, the same area being evaluated for TREE CLASS.

When estimating tree cull, first estimate and record the percentage of ROTTEN/MISSING CULL using the guidelines provided below (Table 8.7: Percentage of rotten cull guidelines). When a portion of a tree includes both ROTTEN/MISSING and ROUGH CULL, include the estimated portion as ROTTEN/MISSING CULL only. ROUGH CULL and ROTTEN/MISSING CULL should never add up to more than 100-percent.

If a live tree is physically missing some of its volume (below ACTUAL LENGTH), use the volume estimation tables (Table 8.8: Percentage of tree cubic foot volume distribution by 16-foot logs from tree total length or tree height in logs for a tree of average dimensions) below to estimate the missing percentage. Broken tops occur above ACTUAL LENGTH and are not included in ROTTEN/MISSING CULL (the volume of the broken top is obtained in the office by comparing ACTUAL LENGTH vs. TOTAL LENGTH).

If a snag is physically missing some of its volume, calculate the percentage of MISSING CULL of the remaining portion of the snag (i.e., if a snag is 8 feet in length, calculate the percentage of MISSING CULL of the 7-foot section remaining above stump height).

Use the following PNW-FIA regional guidelines to determine the percentage of ROTTEN CULL in live trees.

The following are indicators that bole rot exists:

- There is an open or closed trunk wound over 10 years old and in contact with ground.
- There is an open trunk wound with visible rot or a closed trunk wound >10 years old. To qualify, the wound must be either 10 feet long in lower half of bole or 16 feet long in top half of bole. For true fir and hemlock, the wound must be ≥ 5 feet long anywhere on bole.
- The tree is a conifer and has, in lower 2/3 of the bole, two or more crooks or forks which indicate past top out.
- There is a swollen or hollow butt.
- There are large rotten knots or limb stubs.
- There are conks.

Table 8.7: Percentage of rotten cull guidelines

Percent Rotten Cull Guide	Indicators of this class
Bole is 75 percent to 99 percent rotten if one or more of these indicators are present	*E. tinctorium* or *P. pini* conks present and spread along > 60 percent of bole
	E. tinctorium or *P. pini* conks present and spread along >30 percent of bole and top missing
	> 60 percent of bole rotten based on rot indicators above
	30 to 59 percent of bole rotten and top out
	Oligoporus amarus rot, conk or shot hole cup on incense cedar or *Fomitopsis officinalis* conk on douglas fir, pine, larch
	Hardwood > 100 years old and any amount of rot or 2 or more conks
Bole is 40 percent to 74 percent rotten if one or more of these indicators are present	*E. tinctorium* or *Phellinus cancriformans* present
	P. pini conks spread along 30-59 percent of bole
	30-59 percent of bole rotten based on rot indicators above
	Tree is a hardwood and one conk present
Bole is 10 percent to 39 percent rotten if one or more of these indicators are present	none of above class indicators present (as noted in this table)
	> 10 percent of bole rotten based on rot indicators above
Bole is less than 10 percent rotten	< 10 percent of bole rotten based on rot indicators above

Use Table 8.8: as a guideline to estimate the missing portion of a live tree because of cull. It shows the percentage of volume in typical trees of varying number of logs and heights. Use either the tree height in logs (divide the length to a 4-inch top – diameter inside bark [DIB] – by 16) or the measured TOTAL LENGTH to estimate what percentage of volume is estimated in each 16-foot log. Multiply each percentage in that log section times the percentage of rotten or missing volume. Then sum the values to get the total percentage of the tree that is rotten or missing.

- Example: A 9-log tree (measured at 160 feet TOTAL LENGTH) has a missing section that is about 1/3 of both the second and third logs. Table 8.8: shows the second log has about 18 percent of the volume in the tree, and the third log has about 16 percent of the volume in the tree.
  - Calculate the percentage of cull in each log and sum to estimate the total percentage of cull for the tree (about 11 percent):
    - (0.18 X 0.33) + (0.16 X 0.33) = 0.06 + 0.05 = 0.11

Table 8.8: Percentage of tree cubic foot volume distribution by 16-foot logs from tree total length or tree height in logs for a tree of average dimensions

Average Total Length	Tree Height in LOGS	Log1	Log2	Log3	Log4	Log5	Log6	Log7	Log8	Log9	Log10	Log11	Log12
28	1	100											
48	2	70	30										
64	3	54	32	14									
80	4	43	30	19	8								
96	5	36	27	20	12	5							
111	6	31	24	20	14	8	3						
127	7	28	22	18	14	10	6	2					
143	8	25	20	17	14	11	8	4	1				
158	9	24	18	16	13	11	8	6	3	1			
176	10	22	17	15	13	11	9	7	4	1	1		
194	11	20	15	14	12	11	9	7	5	4	2	1	
212	12	20	14	13	12	11	9	8	6	4	2	1	0

Record the reason for the ROTTEN/MISSING CULL by recording a DAMAGE AGENT code when appropriate (see Section 8.8, Tree Damage). Note: it may not be possible to record a DAMAGE AGENT if three higher priority DAMAGE AGENTS have already been recorded.

When GROWTH SAMPLE TREE = N, the percent ROTTEN/MISSING CULL from the previous visit will be downloaded. Update this value if there is an obvious error or change.

When Collected:	*For all live tally trees ≥ 5.0 inches DBH/DRC: record ROTTEN/MISSING CULL. For standing dead tally trees ≥ 5.0 inches DBH/DRC: record MISSING CULL only.*
Field width:	2 digits
Tolerance:	+/- 10 percent
Values:	00 to 99

Item 8.8.0.6 ROUGH CULL (CORE OPTIONAL 5.25)
[TREE.ROUGHCULL]

For each live *conifer, red alder, or big leaf maple* tally tree 5.0 inches DBH/DRC and larger, record the total percentage of cubic-foot volume that is cull due to sound dead material or tree form. Record to the nearest 1 percent. When estimating volume loss (tree cull), only consider the cull on the merchantable bole of the tree, from a 1-foot stump to a 4-inch top.

For woodland species, the merchantable portion is between the point of DRC measurement to a 1.5-inch DOB *(diameter outside bark)* top, and rough cull includes only sound dead.

Use Table 8.8 on the distribution of logs by tree length to determine how much of the merchantable volume to deduct for defects such as forks, sweeps, crooks, pistol butts, etc., or sound dead wood. Rough cull deductions should only be made for the portion of the log that is affected by the defect. The minimum requirement for a tree to be considered merchantable is that it has one solid 8' section (reasonably free of form defect) greater than 4" DOB, now or prospectively in the future. Trees that do not meet this requirement should be coded as 99% rough cull, or the remainder of the merchantable bole after rotten/missing cull deductions have been recorded. Small trees (5-9 inches for softwoods and 5-11 inches for hardwoods) that have poor form and are not expected to ever produce merchantable material should be coded 99 percent rough cull.

When GROWTH SAMPLE TREE = N, the percent ROUGH CULL from the previous visit will be downloaded. Update this value if there is an obvious error or change.

- **Code only when the ROUGH CULL covers 3.0 feet or more of the tree.**

When Collected:	All live *conifer, red alder, or big leaf maple* tally trees ≥ 5.0 inches DBH/DRC
Field width:	2 digits
Tolerance:	+/- 10 percent
Values:	00 to 99

SECTION 8.9 MISCELLANEOUS TREE MEASURED DATA ITEMS

SUBSECTION 8.9.1 LIVE TREE MEASURED DATA ITEMS

Item 8.9.1.1 CAVITY PRESENCE (PFSL)
[TREE.CAVITY_USE_PNWRS]

Record a code to indicate wildlife use. A cavity must be able to be used by wildlife (birds, small mammals, large mammals, etc.) to be coded. If more than one cavity is present, record the size of the largest one.

When GROWTH SAMPLE TREE = N, the CAVITY PRESENCE code from the previous visit will be downloaded. Update this value if there is an obvious error or change.

When collected:	All live and standing dead tally trees ≥ 5.0 inches DBH/DRC	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	No cavity or den present
	1	Cavity or den present < 6.0 inches wide
	2	Cavity or den present ≥ 6.0 inches wide

Item 8.9.1.2 REMNANT TREE (PFSL)
[TREE.REMNANT_CD_PNWRS]

A remnant tree is a tree left by previous management activity or catastrophic event that is significantly older than the surrounding vegetation. Remnant trees do not form a canopy layer and are usually isolated individuals or small clumps. Record a code that indicates whether or not the tree is a remnant.

When GROWTH SAMPLE TREE = N, the REMNANT TREE code from the previous visit will be downloaded. Update this value if there is an obvious error or change.

When collected:	All live tally trees ≥ 5.0 inches DBH/DRC	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	No
	1	Yes

Item 8.9.1.3 FORM CLASS (PFSL)
[TREE.FORMCL]

Record this code for all live hardwood trees ≥ 5.0 inches DBH. The FORM CLASS code is used in calculating net tree volume. When estimating form class, only consider the merchantable bole/portion of the tree from a 1-foot stump to a 4-inch top. Woodland species do not require a FORM CLASS. A log is considered straight if a line drawn through the centers of both ends of the log does not pass outside the curve of the log.

Stoppers are defects that result in a length deduction of a log and include forks, culled missing sections, and rot.

When GROWTH SAMPLE TREE = N, the FORM CLASS code from the previous visit will be downloaded. Update this value if there is an obvious error or change.

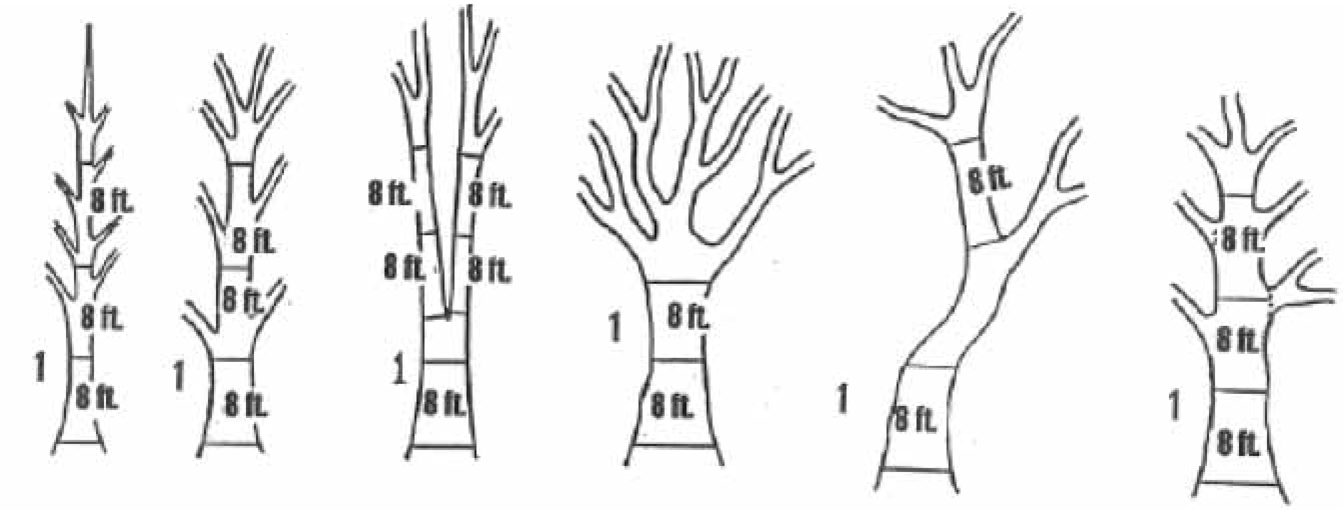


Figure 8.48: Various Examples of Hardwood form Class 1

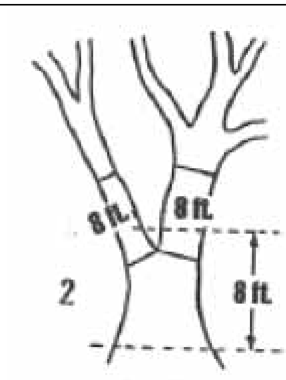


Figure 8.49: Fork stopping an 8' section

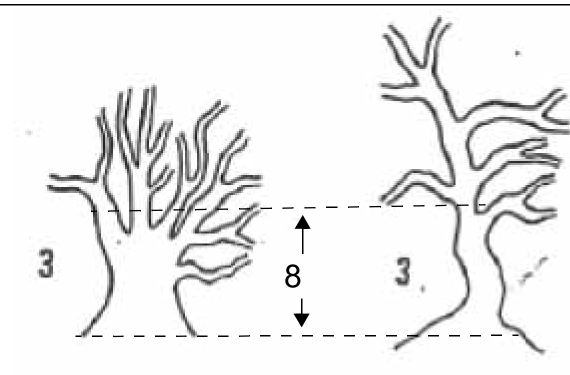


Figure 8.50: Trees with no qualifying 8' section

When collected:	All live hardwood tally trees (excluding woodland species) ≥ 5.0 inches DBH	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Form class
	1	First 8 feet above stump is straight.
	2	First 8 feet above stump is **not** straight or forked; but must have at least one straight 8 foot log elsewhere in the tree.
	3	No 8 foot logs anywhere in tree now or in the future due to form.

SUBSECTION 8.9.2 STANDING DEAD OR REMOVED

Item 8.9.2.1 CAUSE OF DEATH (CORE 5.21)
[TREE.AGENTCD_PNWRS]

<u>Record a CAUSE OF DEATH for all trees that have died or been cut since the previous survey. If CAUSE OF DEATH cannot be reliably estimated, record unknown/not sure/other.</u>

When a tree has been killed by fire, drought, beetles, etc., then salvage logged, CAUSE OF DEATH should be 80, as this is required when PRESENT TREE STATUS = 3. Write a TREE NOTE explaining that the tree was killed by fire (or drought, insects, etc.) then salvage logged.

When Collected:	When SAMPLE KIND = 2: all PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2 or 3; or PRESENT TREE STATUS = 2 and RECONCILE = 1, 2, 7 or 8; or PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2 and RECONCILE = 9
Field width:	2 digits
Tolerance:	No errors

Values:	Code	Description	Core Code (office use only)
	10	Insect	10
	20	Disease	20
	30	Fire	30
	40	Animal	40
	50	Weather	50
	51	Flood	50
	52	Wind (direct cause only; use 71 if killed by falling tree)	50
	53	Avalanche (snow & ice)	50
	54	Landslide (soil & rock)	50
	55	Severe and/or extended drought	50
	60	Vegetation (suppression, competition, vines/kudzu)	60
	70	Unknown/not sure/other – includes death from human activity not related to silvicultural or landclearing activity (accidental, random, etc.). TREE NOTES required.	70
	71	*Hit or knocked over by falling object (tree, snag, rock, etc.)*	70
	80	Silvicultural or landclearing activity (death caused by harvesting or other silvicultural activity, including girdling, chaining, etc., or to landclearing activity).	80

Item 8.9.2.2 MORTALITY YEAR (CORE OPTIONAL 5.22)
[TREE.MORTYR]

On remeasurement plots (SAMPLE KIND = 2), record the estimated year that remeasured trees died or were cut. For each remeasured tree that has died or been cut since the previous inventory, record the 4-digit year in which the tree died. MORTALITY YEAR is also recorded for trees on land that has been converted to a nonforest land use, if it can be determined that a tree died before the land was converted.

When a tree has been killed by fire, drought, beetles, etc., then salvage logged, MORTALITY YEAR should be recorded as the year the tree died due to the fire, drought, or other. This may, or may not, be the same year as the tree was cut. Write a TREE NOTE explaining that the tree was killed by fire (or drought, insects, etc.) then salvage logged.

When Collected:	When SAMPLE KIND = 2: all PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2 or 3; or PRESENT TREE STATUS = 2 and RECONCILE = 1, 2, 7 or 8; or PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2 and RECONCILE = 9.
Field width:	4 digits
Tolerance:	+/- 1 year for remeasurement cycles of 5 years
	+/- 2 years for remeasurement cycles of > 5 years
Values:	*YEAR OF PREVIOUS INVENTORY* or higher

Item 8.9.2.3 DECAY CLASS (CORE 5.23)
[TREE.DECAYCD]

Record for each standing dead tally tree, 1.0 inch in diameter and larger, the code indicating the tree's stage of decay.

When standing dead trees have characteristics from more than one DECAY CLASS stage, record the best overall stage of the snag (e.g., new dead with no fine limbs left because it broke below the crown, should be coded as "1").

Rarely will a DECAY CLASS 5 tree be recorded; by the time a dead tree has reached DECAY CLASS 5 it will be unlikely to meet the definition of standing dead.

Snag characteristics are for Douglas-fir. Snags of other species may vary; use this table as a guide. Rate the overall snag					
DECAY CLASS stage (code)	Limbs and branches	Top	Percent bark remaining	Sapwood presence and condition*	Heartwood condition*
1	All present	Pointed	100	Intact; sound, incipient decay, hard, original color	Sound, hard, original color
2	Few limbs, no fine branches	May be broken	Variable	Sloughing; advanced decay, fibrous, firm to soft, light brown	Sound at base, incipient decay in outer edge of upper bole, hard, light to reddish brown
3	Limb stubs only	Broken	Variable	Sloughing; fibrous, soft, light to reddish brown	Incipient decay at base, advanced decay throughout upper bole, fibrous, hard to firm, reddish brown
4	Few or no stubs	Broken	Variable	Sloughing; cubical, soft, reddish to dark brown	Advanced decay at base, sloughing from upper bole, fibrous to cubical, soft, dark reddish brown
5	None	Broken	Less than 20	Gone	Sloughing, cubical, soft, dark brown, OR fibrous, very soft, dark reddish brown, encased in hardened shell

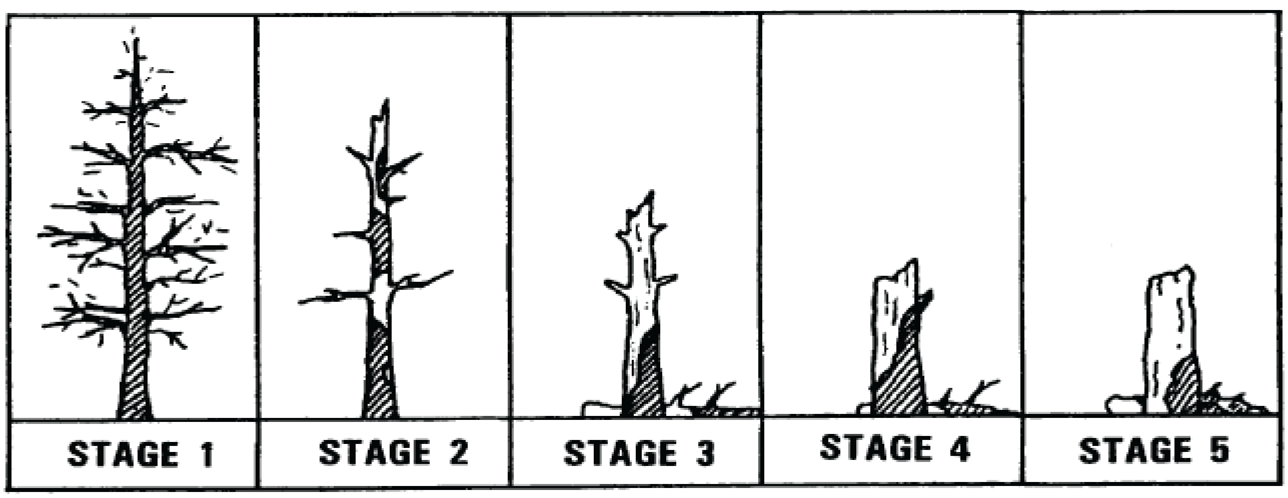


Figure 8.51: Douglas-fir decay class characteristics (use only as a guide)

When Collected:	All standing dead tally trees ≥ 1.0 inch DBH/DRC
Field width:	1 digit
Tolerance:	+/- 1 class
Values:	*1-5*

Item 8.9.2.4 SNAG REASON FOR DISAPPEARANCE (AFSL, PFSL)
[TREE.SNAG_DIS_CD_PNWRS]

On remeasurement, record a code to indicate the reason for disappearance of a tree previously tallied as standing dead.

When collected:	When SAMPLE KIND = 2: All standing dead trees tallied at the previous inventory which no longer qualify as standing dead (PREVIOUS TREE STATUS = 2, PRESENT TREE STATUS = 2, and STANDING DEAD = 0)	
Field width:	1 digit	
Tolerance:	No Errors	
Values:	Code	Description
	2	Fell over "naturally" (wind, decay, etc.) or no longer self-supported; still present.
	3	Fell over "naturally;" removed from the site, or not discernible by crew.
	4	Cut down or pushed over; still present.
	5	Cut down or pushed over; removed from the site, or not discernible by crew.
	6	DBH/DRC and/or height no longer meet minimum for tally (snag "shrank" to less than 5.0 inches DBH/DRC on the subplot/macroplot, less than 1.0 inches DBH/DRC on the microplot, or less than 4.5 feet tall).

Item 8.9.2.5 CULTURALLY KILLED (AFSL, PFSL)
[TREE.CULTURALLY_KILLED_PNWRS]

A 1-digit code to identify cut trees that have been killed by direct human intervention, but not utilized (removed from plot).

Note: When CULTURALLY KILLED = 1, a TREATMENT (Item 5.7.2.44) must be recorded.

When collected:	When SAMPLE KIND = 2: All trees with PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	Any tree that does not meet the criteria listed in code 1.
	1	Any tree that was killed by direct human cause (girdled, cut, knocked over, sprayed with herbicide, etc.) which has not been removed from plot (a TREATMENT must be recorded).

SECTION 8.10 TREE NOTES

SUBSECTION 8.10.1 TREE NOTES

Item 8.10.1.1 TREE NOTES (CORE 5.27)
[TREE.NOTES]

Record notes pertaining to an individual tree as called for to explain or describe another data item.

When Collected:	All trees, as needed
Field width:	2000 characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

CHAPTER 9 SEEDLING DATA

SECTION 9.1 GENERAL INSTRUCTIONS

Regeneration information is obtained by counting live seedlings within the 6.8-foot radius microplot located 90 degrees and 12.0 feet from each subplot center within each of the four subplots. Seedlings are counted in groups by species and condition class. Only count seedlings occurring in accessible forest land condition classes *(CONDITION CLASS STATUS = 1), or accessible, measurable nonforest condition classes (NONFOREST CONDITION CLASS STATUS =2), using the guidelines listed below*.

SUBSECTION 9.1.1 SEEDLING DATA ITEMS

Item 9.1.1.1 SUBPLOT NUMBER (CORE 6.1)
[SEEDLING.SUBP]

This is a generated code corresponding to the number of the subplot (see Item 6.1.1.1).

When Collected:	*All seedling count records*	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 9.1.1.2 CONDITION CLASS NUMBER (CORE 6.3)
[SEEDLING.CONDID]

Use the same procedures described in *Chapter 8 to assign the appropriate CONDITION CLASS NUMBER to the seedlings rooted in the respective condition*.

When Collected:	*All seedling count records*
Field width:	1 digit
Tolerance:	No errors
Values:	1-9

Item 9.1.1.3 SPECIES (CORE 6.2)
[SEEDLING.SPCD]

Record the SPECIES code from the Tree Species List in Appendix D. Use the same procedures described in Item 8.5.1.12.

If the species cannot be determined in the field, tally the seedling, but bring branch samples, foliage, flowers, bark, etc. to the office for identification. If possible, collect samples outside the macroplot from similar specimens and make a note to correct the SPECIES code later.

When Collected:	*All seedling count records*
Field width:	4 digits
Tolerance:	No errors for genus, no errors for species
Values:	Appendix D

Item 9.1.1.4 SEEDLING COUNT (CORE 6.4)
[SEEDLING.TREECOUNT]

On each microplot, record the number of live tally seedlings, by *SPECIES* and *CONDITION CLASS*. Conifer seedlings must be at least 6.0 inches in length and less than 1.0 inch at DBH to qualify for counting. Hardwood seedlings must be at least 12.0 inches in length and less than 1.0 inch at DBH in order to qualify for counting.

For woodland species, each stem on a single tree must be less than 1.0 inch at DRC.

General seedling count rules:

- Count all live seedlings with their bases inside the microplot boundary regardless of vigor, damage, or closeness to other trees.
- Multiple "suckers" that originate from the same location, and stump sprouts are considered one seedling. If multiple seedlings originate from a standing dead tally tree count as one seedling.
- Measure seedling length, not "height". Length is measured along the main stem from ground level to the dominant apical leader.
- Do not tally or count "layers" (undetached tree branches partially or completely covered by soil and/or organic materials, usually at the base) as seedlings.
- Do not tally any seedlings that sprout from a live tally tree.

When Collected:	Each measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) on each microplot
Field width:	3 digits
Tolerance:	No errors for 5 or fewer per species; +/-20% percent over a count of 5
Values:	001 through 999

Item 9.1.1.5 SEEDLING NOTES (PNW)
[SEEDLING.NOTES]

Record notes to clarify or explain a special situation in the SEEDLING NOTES.

When Collected:	As needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

CHAPTER 10 SITE TREE INFORMATION

SECTION 10.1 OVERVIEW

Site index is a measure of a forest's potential productivity and is defined as the height of the dominant or co-dominant trees at a specified age in a stand. It is calculated in an equation using the tree's length and age. Site index can help predict timber productivity and the potential growth rate of a forest. For PNW-FIA, the site index is used primarily as input to the mean annual increment (MAI) equations. Site index equations differ by tree species and region.

Trees must meet specific selection criteria before being used to calculate site index. PFSL employs three selection methods: King's, Primary, and California Mixed Conifer. The CALIFORNIA MIXED CONIFER METHOD is an adaptation of the PRIMARY SELECTION METHOD that has been expanded to accept several tree species within the California Mixed Conifer forest type. Each selection method has its own set of specific criteria for selecting site trees and is used with the KEY TO SITE TREE SELECTION to determine a quality set of site tree data.

SECTION 10.2 GENERAL INSTRUCTIONS

<u>If suitable site trees are available, site tree data are required for every accessible forest land condition class defined on a plot. An individual site tree may be used for more than one condition class where differences in condition classes are not the result of differences in site productivity. For example, when different condition classes are caused solely due to differences in reserved status, *or* owner class, a site tree may be used for more than one condition class. When in doubt, do not use a site tree for more than one condition class.</u>

<u>Select at least one site tree for each accessible forest land condition class where no previous site tree data exist *or where previous site tree data is incomplete or unreliable*. The absence of site tree data may occur because:</u>

- <u>This is the first visit to the site</u>
- <u>On the previous visit no suitable site tree could be found for the condition</u>
- <u>Since the last visit there has been a change in condition class that renders the previous data incompatible with the current conditions</u>

<u>If a site tree is needed, select *the* tree from a species common to the condition class being sampled, based on the criteria listed below (see Section 10.4). Select trees *outside* the subplot*/macroplot boundary* where possible. Use only trees that have remained in a dominant or co-dominant crown position throughout their entire life span. If possible, trees should be 5.0 inches in diameter, or larger, and at least *15* years old *at breast height*.</u> Trees with damages appearing to substantially reduce height growth, trees with ring patterns that exhibit signs of suppression, and trees with rotten cores should be rejected.

PNW requires at least three site trees for each accessible forest land condition class with a GROUND LAND CLASS (GLC) of 120 (Timberland); each tree collected as a site tree must meet the selection criteria appropriate to the site, following Section 10.4. Note King's method requires 5-10 site trees depending on the STAND AGE. When the selection criteria cannot be met, or for an accessible forest land condition class with a GLC other than 120, only one site tree is required for that condition class. Not all of the site trees need to be from the current inventory.

The first step in site tree selection is to determine the appropriate method for the site being sampled. Use Section 10.4, Site Index Equation Selection Method and Site Tree Selection Key for OR, WA and CA to determine the appropriate method for the site. Once the appropriate method has been determined, follow the key to select any new site trees needed. If previously collected site trees are present in the data, crews must determine if they are appropriate for the site based on the key in Section 10.4. When choosing a site tree, try to select from a species representative of the stand being sampled. Generally, the preferred site tree species coincides with the FOREST TYPE. FOREST TYPE is a classification of forest land based on the trees or tree communities representing the plurality of stocking for all live trees not overtopped in the condition (see FOREST TYPE, Item 5.7.1.9). For PNW, "representative of the stand" means a species defining the FOREST TYPE.

If no suitable site trees are available from the plot area, the field crew will consider all trees within a 400-foot radius of plot center. If appropriate site trees have still not been found, crews may select trees more than 400 feet away from plot center. Site trees collected off plot should be from an area best representing the conditions found on the plot (e.g., aspect, slope, elevation, substrate, moisture regime, etc.).

If no suitable site trees can be found on or off plot, or if the required number of trees within the desired site index range cannot be met, a detailed explanation must be given in the electronic PLOT NOTES (Item 4.3.5.5) explaining the circumstances. Important note: “No suitable site trees” is not acceptable! Please explain why there were no suitable site trees. Examples: storm damage, disease, or evidence of suppression throughout stand; pure oak stand therefore no acceptable site tree species available; or the stand is too young.

When no site trees are collected, additional PLOT NOTES should include general topography, moisture regime, and substrate material in order to aid analysts in creating a reasonable site index for the plot. Using your best professional judgement describe the general characteristics of the site. You may include slope, aspect, water availability (e.g., droughty or boggy), and soil type (e.g., rocky, loamy, or clayey). General descriptors like "boggy black spruce area" or "shallow rocky soil" or "cold alpine area" are helpful. For younger plantations with no previous site tree data and no current tree tally include total height and current age at breast height and/or height growth for saplings.

The field crew should delete new site tree records not considered within the tolerable site index range only when the minimum number of trees has been met for the selection method.

SECTION 10.3 PLOTS WITH SITE TREES COLLECTED PREVIOUSLY

At previous inventories, site tree data were collected at the plot level and will usually correspond to the current condition class 1. Crews should verify previously collected site trees meet the SPECIES, AGE, and SITE INDEX range requirements for the current condition class being sampled, according to the key in Section 10.4.

Generally, additional site trees are needed when site index information is incomplete, absent, or unreliable. In the field, the crew should evaluate the validity of previous site trees by checking SITE TREE SELECTION METHOD, SITE TREE AGE, LENGTH, SPECIES, and SITE INDEX in the PDR. Printouts can be unreliable as changes have been made to some site tree data in the office since the last inventory. When possible, crews should confirm downloaded data by comparing it to the actual tree. Do not delete or make changes to downloaded site tree records; if SITE TREE SELETION METHOD, SPECIES, DIAMETER, SITE TREE LENGTH and/or TREE AGE AT DIAMETER appears to be grossly incorrect, enter the correct data as a new record. In this situation, the SITE TREE STATUS of the downloaded tree should be changed to "I" (invalid). Explain why invalidated site trees are no longer valid in SITE TREE NOTES, Item 10.5.1.17. Verifying and updating the CONDITION CLASS LIST on downloaded site trees is required.

In general new site trees should be collected if:

- the previous selection method is inappropriate for the site.
- previous site trees are outside of the preferred age range for the site, and site trees are available within this range.
- the site tree species are not an acceptable combination for the FOREST TYPE or site.
- there has been a change in FOREST TYPE; however, within King’s zone, Douglas-fir is always preferred.
- the previous crew collected site trees that do not meet the current criteria and/or better site trees can be found.
- a treatment has occurred affecting the site’s productivity (e.g., irrigation, fertilization, etc.)
- the previous site index looks suspicious (e.g., too low, too high, or has a wide range)
- the current crew has noticed discrepancies in previous tree measurements (e.g., tree lengths are consistently less at current visit than at previous visit due to previous crew errors)

SECTION 10.4 SITE INDEX EQUATION SELECTION METHOD AND SITE TREE SELECTION KEY FOR OR, WA AND CA

PFSL employs three methods to select a population of trees best representing the site's potential productivity. Below is a key to help field crews decide which method best suits the site. Only use the previous method when it is the appropriate method for the site. If the previous selection method is determined to be incorrect for the site, then collect new site trees using the appropriate method for the site based on the steps below (explain why invalidated site trees are no longer valid in SITE TREE NOTES, Item 10.7.1.22). In some cases, it may be possible to re-enter previously collected site trees on a new line with the appropriate selection method, if they meet all other criteria for the appropriate selection method (see descriptions below).

A. Is the condition in a coastal Douglas-fir site (see description below) less than 130 years old (stand age), and below 3000 feet in elevation?

Yes . . . . King's Method
No . . . . go to B

B. Is the condition a California Mixed Conifer forest type (see description below)?

Yes . . . . CA Mixed Conifer Method
No . . . . Primary Method

King's Method

King's is the preferred selection method for coastal Douglas-fir sites throughout western Washington, Oregon, and northern California. Only use this method if the overall stand age is less than 130 years old, and the plot is located below 3000 feet in elevation.

Coastal Douglas-fir sites are found in coastal counties in northwestern California, and western Oregon and Washington on the west slopes of the Coast Range and foothills west of the Cascades. In California, Douglas-fir is often found in combination with redwood, forming more pure stands on the higher, drier slopes. Grand fir, Sitka spruce, red alder, western hemlock, and western red-cedar may also be found on a Coastal Douglas-fir site.

Any site tree with a clear history of suppression should be rejected, and the next largest tree if it is suitable should be selected. Do not use trees with abnormally formed tops (forked tops or top outs) or with any other damages. Do not use trees with extrapolated ages.

1. The average breast height age of the stand is greater than or equal to 30 years.

No . . . . go to 2
Yes . . . . Locate a group of at least 25 mainstand Douglas-fir and/or grand fir trees in an area of no more than 130 ft diameter and go to 1.1

1. 1. First Choice: Select 5 Douglas-fir site trees.

   a. Within the age range of 30-80.
   b. Site index varies by no more than 20
   c. Dominant or codominant with no history of suppression
   d. No damages

1. 2. Second Choice: Select a mix of Douglas-fir and grand fir site trees for a total of 5 site trees. Douglas-fir and grand fir can be combined, however, Douglas-fir is preferred.

   a. See 1.1 criteria

1. 3. Third Choice: Select 5 western hemlock site trees.

   a. See 1.1 criteria

1. 4. Fourth Choice: Select Sitka spruce or a mix of western hemlock and sitka spruce site trees for a total of 5 site trees.

   a. See 1.1 criteria

1. 5. Fifth Choice: Work through 1.1-1.4 above, expanding the age range to 15-250.

1. 6. Sixth Choice: Five trees are required for this method. If the stocking does not perfectly fit (i.e. 25 mainstand trees within 130 ft diameter) but 5 site trees are available this is still the preferred method; work through 1.1-1.5, above. If 5 suitable trees (between 15-250 years old, with site indices within 20) cannot be collected, go to B.

2. The average breast height age of the stand is less than 30 years.

No . . . . go to 1
Yes . . . . Locate a group of at least 50 mainstand Douglas-fir and/or grand fir trees in an area of no more than 130ft diameter and go to 2.1

2. 1. First Choice: Select 10 Douglas-fir site trees.

a. Within the age range of 15-35.
b. Site index varies by no more than 20
c. Dominant or codominant with no history of suppression
d. No damages

2. 2. Second Choice: Select a mix of Douglas-fir and grand fir site trees for a total of 10 trees. Douglas-fir and grand fir can be combined, however, Douglas-fir is preferred.

a. See 2.1 criteria.

2. 3. Third Choice: Select 10 western hemlock site trees.

a. See 2.1 criteria.

2. 4. Fourth Choice: Select Sitka spruce or a mix of western hemlock and sitka spruce site trees for a total of 10 site trees.

a. See 2.1 criteria.

2. 5. Fifth Choice: Work through 2.1-2.4 above, expanding the age range to 15-80.

2. 6. Sixth Choice: Ten site trees are required for this method. If the stocking does not perfectly fit (i.e. 50 mainstand trees within 130ft diameter) but 10 site trees are available, this is still the preferred method; work through 2.1-2.5, above. If 10 suitable trees (between 15-80 years old, with site indices within 20) cannot be collected, go to B.

CA Mixed Conifer Method

Mixed conifer types grow on the east facing slopes of the Coast Range and on the west facing slopes, or at higher elevation, east facing slopes of the Cascades and Sierra Nevada. This type also extends south into southern California. Trees can be any combination of ponderosa pine, Douglas-fir, white fir, red fir or Shasta red fir. If additional site trees are needed to satisfy the minimum of 3 trees per condition, then sugar pine, Jeffrey pine, and incense cedar can be used. Do not use any other species when in this forest type. For PNW, “representative of the stand” means the species defining the forest type. “Not representative of the stand” means a species found in the condition, but it is not the species defining the forest type. Do not collect any species not found in tables 10.1 or 10.2.

Condition Ground Land Class (GLC) = 120?

NO . . . . One site tree required
YES. . . . . Three site trees required

1. First choice: Representative of the stand and found in Table 10.1: Group A, below

a. Within the preferred age range for the stand (between 35 and 80 years old at breast height)
b. Site index varies by no more than 20 (site indices for starred species in Tables 10.1 and 10.2 can vary by up to 30)
c. Dominant or co-dominant with no history of suppression
d. No damages

2. Second choice: Not representative of the stand and found in Table 10.1: Group A, below

a. See 1 criteria

3. Third choice: Representative of the stand and found in Table 10.2: Group B, below

a. See 1 criteria

4. Fourth choice: Not representative of the stand and found in Table 10.2: Group B, below

   a. See 1 criteria

5. Fifth choice: Work through 1-4 above expanding the age range to 15-250 years old at breast height

6. Sixth Choice: Work through 1-5 above allowing site index to vary by more than 30. Use questionable site tree flag = 0 for any site trees outside of the desirable site index range

7. Last resort (collect only one site tree if no other trees are available; requires QUESTIONABLE SITE TREE FLAG = 0):

   a. Any acceptable site tree species from Table 10.1: Group A, and Table 10.2: Group B
   b. May be greater than 250 years old
   c. May have damages not appearing to substantially reduce height growth (for example, dead or broken tops clearly affect height growth, so trees with these damages should not be used)
   d. Trees with extrapolated ages
   e. DO NOT USE: Any trees showing signs of suppression or with rotten cores

   If a "last resort" tree is collected, explain why it is a last resort in the SITE TREE NOTES. Never combine a "last resort" tree with any other site tree. Record the appropriate QUESTIONABLE SITE TREE FLAG (Item 10.5.1.4) = 0 "Site tree does not meet selection criteria" for all last resort trees.

Primary Method

The Primary selection method now includes several different site equations. In Oregon and Washington, use this method if King's cannot be met. In California, use this method if King's or the CA Mixed Conifer method cannot be used. Do not mix tree species. The only exception to this rule is noble fir and mountain hemlock can be combined, however, noble fir is preferred. For PNW, "representative of the stand" means the species defining the forest type. "Not representative of the stand" means a species found in the condition, but it is not the species defining the forest type. Do not collect any species not found in tables 10.1 or 10.2.

Condition Ground Land Class (GLC) = 120?

NO . . . . One site tree required
YES. . . . . Three site trees required

1. First choice: Representative of the stand and found in Table 10.1: Group A, below

   a. Within the preferred age range for the stand (between 35 and 80 years old at breast height).
   b. Site index varies by no more than 20 (site indices for starred species in Tables 10.1 and 10.2 can vary by up to 30)
   c. Dominant or co-dominant with no history of suppression
   d. No damages

2. Second choice: Not representative of the stand and found in Table 10.1: Group A, below

   a. See 1 criteria

3. Third choice: Representative of the stand and found in Table 10.2: Group B, below

   a. See 1 criteria

4. Fourth choice: Not representative of the stand and found in Table 10.2: Group B, below

   a. See 1 criteria

5. Fifth choice: Work through 1-4 above expanding the age range to 15-250 years old at breast height

6. Sixth Choice: Work through 1-5 above allowing site index to vary by more than 30. Use questionable site tree flag = 0 for any site trees outside of the desirable site index range

7. Last resort (collect only one site tree if no other trees are available; requires QUESTIONABLE SITE TREE FLAG = 0):

   a. Any acceptable site tree species from Table 10.1: Group A, and Table 10.2: Group B

b. May be greater than 250 years old
c. May have damages not appearing to substantially reduce height growth (for example, dead or broken tops clearly affect height growth, so trees with these damages should not be used)
d. Trees with extrapolated ages
e. DO NOT USE: Any trees showing signs of suppression or with rotten cores

If a “last resort” tree is collected, explain why it is a last resort in the SITE TREE NOTES. Never combine a “last resort” tree with any other site tree. Record the appropriate QUESTIONABLE SITE TREE FLAG (Item 10.5.1.4) = 0 “Site tree does not meet selection criteria” for all last resort trees.

Table 10.1: Group A

Species code	Common name	Forest type
11	Pacific silver fir	264
15	White fir*	261
17	Grand fir	267
19	Subalpine fir	268,266
20	California red fir	262
21	Shasta red fir	262
22	Noble fir*	263
73	Western larch	321
93	Engelmann spruce	265, 266
98	Sitka spruce	305
108	Lodgepole pine*	281
119	Western white pine*	241
120	Bishop pine	363
122	Ponderosa pine*	221
202	Douglas-fir*	201
211	Redwood	341
242	Western red cedar	304
263	Western hemlock	301
264	Mountain hemlock*	270
351	Red alder	911

Table 10.2: Group B

Species code	Common name	Forest type
42	Alaska yellow-cedar	271
64	Western juniper	369
72	Subalpine larch	368
81	Incense cedar	222
94	White spruce	122
95	Black spruce	125
103	Knobcone pine	361
104	Foxtail pine	365
109	Coulter pine*	226
116	Jeffrey pine*	225
117	Sugar pine	224
124	Monterey pine	364
127	Gray pine	921
201	Bigcone Douglas-fir	203

*Starred species are associated with 100-year site equations and site indices may vary by up to 30. Douglas-fir is associated with a 100-year site equation only on sites above 3000’ elevation.

SECTION 10.5 SITE TREE DATA ITEMS

SUBSECTION 10.5.1 SITE TREE DATA ITEMS

Item 10.5.1.1 SITE TREE NUMBER (AFSL, PFSL)

[SITETREE.TREE]

The data recorder will automatically assign a number to each new site tree. On previously visited plots numbers will be assigned to downloaded site trees.

When collected:	All site trees
Field width:	4 digits
Tolerance:	No errors
Values:	0001-9999

Item 10.5.1.2 SUBPLOT NUMBER (CORE OPTIONAL 7.2.7)

[SITETREE.SUBP]

Record the subplot number to which the site tree is referenced.

Use the same procedures described in SUBPLOT NUMBER (Item 6.1.1.1). Record a 1-digit code indicating the number of the subplot which a site tree is on or near. Subplot numbers for site trees previously collected will be downloaded/printed if on file.

When collected:	All site trees	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 10.5.1.3 SITE TREE STATUS (AFSL, PFSL)

[SITETREE.SITE_AGE_TREE_STATUS_PNWRS]

This data item is used to determine if this site tree is new “N”, old “O”, or invalid old “I”. New site tree records, copied from the tree screen or entered manually (as a non-tally site tree), will have a status “N”. Downloaded tree records from the previous visit have status of “O”. If information for an old site tree (“O”) is copied into a new site tree record, update with current information, change the SITE TREE STATUS code from “O” to “N”. If an old site tree is determined to be previously collected in error, or a crew does not feel it best represents the forest condition and can replace it with a better representative tree, change the SITE TREE STATUS code from “O” to “I” (explain why the old site trees are no longer valid in SITE TREE NOTES, Item 10.5.1.17).

When collected:	When SAMPLE METHOD CODE = 1: all site trees	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	N	New site tree (copied from previous inventory and updated, copied from current tree tally, or entered manually as non-tally site tree)
	O	Old site tree (downloaded from previous plot visit)
	I	Invalid “Old” site tree (only to be used for procedural differences or previous crew selection error or if better stand representative site trees are now available)

Item 10.5.1.4 QUESTIONABLE SITE TREE FLAG (AFSL, PFSL)
[SITETREE.QUESTION_SITE_AGE_TREE_PNWRS]

Record a code to identify whether or not the current site tree meets the selection criteria as outlined in Section 10.4. Any site tree with a QUESTIONABLE SITE TREE FLAG = 0 requires an electronic SITE TREE NOTE (Item 10.5.1.17) describing why it does not meet the selection criteria. Code "0" must be used for all last resort site trees (choice 7 under Section 10.4) and must be used to indicate old or new site trees outside of the desired site index range.

Downloaded site trees with SITE TREE STATUS = O (old) and QUESTIONABLE SITE FLAG = 0 should be replaced with a new site tree meeting the selection criteria if possible. If a questionable "Old" site tree is replaced with a "New" tree, the "Old" tree should be marked with a SITE TREE STATUS of "Invalid" (explain why the old site tree is no longer valid in SITE TREE NOTES).

When collected:	When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N or O	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	0	Site tree does not meet selection criteria
	1	Selection criteria met

Item 10.5.1.5 CONDITION CLASS LIST (CORE 7.2.1)
[SITETREE.CONDLIST]

<u>*For new site trees (SITE TREE STATUS = N), l*ist all CONDITION CLASS NUMBERS that the site index data from this tree represent.</u> For invalid site trees (SITE TREE STATUS = I), keep the downloaded list and do not update it.

When collected:	All site trees
Field width:	4 digits
Tolerance:	No errors
Values:	1000 to 9876

Item 10.5.1.6 TREE TAG NUMBER (AFSL, PFSL)
[SITETREE.TALLY_TREE_NBR_PNWRS]

This number is automatically recorded when the site tree is copied from tally tree record, and should be entered for any site trees which are also tally trees anywhere on the plot.

When collected:	When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N: When site tree is also a tally tree
Field width:	3 digits
Tolerance:	No errors
Values:	001 to 999

Item 10.5.1.7 AZIMUTH (CORE OPTIONAL 7.2.8)
[SITETREE.AZIMUTH]

<u>Record the AZIMUTH from the subplot center; sight the center of the base of each tree with a compass. Record AZIMUTH to the nearest degree. Use 360 for north.</u>

When collected:	*When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N:* all site trees
Field width:	3 digits
Tolerance:	+/- 10 degrees
Values:	001 to 360

Item 10.5.1.8 HORIZONTAL DISTANCE (CORE OPTIONAL 7.2.9)
[SITETREE.DIST]

Record the measured HORIZONTAL DISTANCE, to the nearest 0.1 feet, from the subplot center to the pith of the tree at the base. When recording a distance greater than 999.9 feet horizontal distance, enter 999.9 in this field then record the actual distance in the SITE TREE NOTES.

When collected:	*When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N:* all site trees
Field width:	4 digits (xxx.y)
Tolerance:	+/- 5 feet
Values:	000.1 to 999.9

Item 10.5.1.9 SPECIES (CORE 7.2.2)
[SITETREE.SPCD]

Record for new site trees. Only use SPECIES codes found in Table 10.1: Group A, and Table 10.2: Group B above. SPECIES is downloaded for site trees previously collected.

When collected:	*When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N:* all site trees
Field width:	4 digits
Tolerance:	No errors
Values:	*0000 to 9999*

Item 10.5.1.10 DIAMETER (CORE 7.2.3)
[SITETREE.DIA]

Use the same procedures described in Section 8.6 (Diameter). DIAMETER is downloaded for site trees previously collected. Record for new site trees.

When collected:	*When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N or O:* all site trees
Field width:	4 digits (xxx.y)
Tolerance:	+/- 0.1 inches per 20.0 inches increment of measured diameter
Values:	001.0 to 999.9

Item 10.5.1.11 SITE TREE LENGTH (CORE 7.2.4)
[SITETREE.HT]

With a clinometer or other approved instrument, measure the total length of the site tree from the ground to the top of the tree. Record to the nearest 1.0 foot. SITE TREE LENGTH must be measured; no estimates are permitted on site trees. Refer to TOTAL LENGTH (Item 8.7.2.5) when measuring SITE TREE LENGTH.

SITE TREE LENGTH is downloaded for site trees previously collected. If updating a downloaded site tree, measure the tree's current length and enter it in the new record for the tree (be sure to also enter a current age at breast height in the new record and mark the old tree record with a SITE TREE STATUS of "Invalid").

When collected:	*When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N or O:* all site trees
Field width:	3 digits
Tolerance:	Less than 60 feet +/- 5 percent of true length Greater than or equal to 60 feet +/- 10 percent of true length
Values:	005 to 999

Item 10.5.1.12 TREE AGE AT DIAMETER (CORE 7.2.5)
[SITETREE.AGEDIA]

Record the tree age as determined by an increment sample. Bore the tree *about one inch below* the point of diameter measurement (DBH) with an increment borer. Count the rings between the outside edge of the core and the pith. Do not add years to get total age.

This is a downloaded value for site trees previously collected and gives the age at the time of the previous inventory. If updating a downloaded site tree, determine the number of years elapsed since the tree was taken as a site tree, add this number to the downloaded age and enter the sum in the new (second) record for the tree (be sure also to measure and enter the current height in the new record and mark the old tree record with a SITE TREE STATUS of "Invalid").

When collected:	*When SAMPLE METHOD CODE = 1, CONDITION CLASS STATUS = 1, and SITE TREE STATUS = N or O:* all site trees
Field width:	3 digits
Tolerance:	+/- 5 years
Values:	001 to 999

Item 10.5.1.13 SITE TREE SELECTION METHOD (PFSL)
[SITETREE.SITE_TREE_METHOD_PNWRS]

This data item distinguishes between King's and Primary, and California Mixed Conifer selection methods for relevant species. This item may be downloaded for site trees previously collected.

When collected:	All site trees	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	K	Kings
	P	Primary
	M	Mixed

Item 10.5.1.14 SITE INDEX (AFSL, PFSL)
[SITETREE.FLD_SITREE_PNWRS]

This code is downloaded for site trees previously collected. For new site trees, the data recorder will calculate site index after SPECIES, SITE TREE LENGTH, TREE AGE AT DIAMETER, SITE INDEX EQUATION NUMBER (PDR generated), and SITE TREE SELECTION METHOD (when appropriate) are entered.

When collected:	Generated by the PDR when SITE TREE STATUS = N
Field width:	3 digits
Tolerance:	N/A
Values:	001 to 999

Item 10.5.1.15 SITE INDEX EQUATION BASE AGE (AFSL, PFSL)
[SITETREE.SIBASE_AGE_PNWRS]

The SITE INDEX EQUATION BASE AGE is used to define the acceptable range for the calculated site index. It is determined by the PDR after SPECIES, SITE TREE LENGTH, TREE AGE AT DIAMETER, SITE INDEX EQUATION NUMBER (PDR generated), and SITE TREE SELECTION METHOD (when appropriate) are entered. Site trees with a base age of 50 should have a site index within 20. Site trees with a base age of 100 should be within 30.

When collected:	Generated by the PDR when SITE TREE STATUS = N	
Field width:	3 digits	
Tolerance:	No errors	
Values:	Code	Definition
	50	50 year base age, site index should be within 20
	100	100 year base age, site index should be within 30

Item 10.5.1.16 SITE INDEX EQUATION NUMBER (PNW)
[SITETREE.SITREE_EQU_NO_PNWRS]

This code is generated by the PDR for all site trees. The SITE INDEX EQUATION NUMBER identifies which site index equation was used to calculate site index. This data item cannot be updated by the field crew.

When collected:	Generated for all site trees when SITE TREE STATUS = N
Field width:	3 digits
Tolerance:	No errors
Values:	See list in Appendix H (Site Index Equation Numbers)

Item 10.5.1.17 SITE TREE NOTES (CORE 7.2.6)
[SITETREE.NOTES]

Record notes pertaining to an individual site tree.

When collected:	All site trees as necessary
Field width:	2000 characters
Tolerance:	N/A
Values:	English language words, phrases and numbers

CHAPTER 11 DOWN WOODY MATERIALS

SECTION 11.1 INTRODUCTION

Down woody materials (DWM) are important components of forest ecosystems across the country. DWM is dead material on the ground in various stages of decay. Wildlife biologists, ecologists, mycologists, foresters, and fuels specialists are some of the people interested in DWM because it helps describe the:

- Quality and status of wildlife habitats.
- Structural diversity within a forest.
- Fuel loading and fire behavior.
- Carbon sequestration – the amount of carbon tied up in dead wood.
- Storage and cycling of nutrients and water – important for site productivity.

Down wood components and fuels estimated by the FIA program are coarse wood, slash, fine wood, and litter and duff depth.

DWM is sampled on accessible forest conditions intersected by a transect, and on accessible, *measurable* nonforest conditions (NONFOREST CONDITION CLASS STATUS = 2). If a transect crosses a condition boundary, the boundary locations on the transect are recorded. All DWM in the inventory is sampled using the line intersect sampling method (also called planar intercept method). In this method, transects are established, and individual pieces of Coarse Woody Debris (CWD, ≥3 inches diameter and ≥0.5 foot long) or Fine Woody Debris (FWD, <3 inches diameter) are tallied if the central axis of the piece is intersected by the plane of the transect.

SECTION 11.2 DEFINITION OF DOWN WOODY MATERIALS

Coarse Woody Debris – In this inventory, CWD includes downed, dead tree and shrub boles, large limbs, and other woody pieces that are ≥3 inches in diameter and severed from their original source of growth. CWD **also** includes dead tally species trees or single-stemmed woodland species trees (either self-supported by roots, severed from roots, or uprooted and supported by other objects) that are leaning >45 degrees from vertical and not considered part of the standing tree inventory. Portions of dead trees that are separated greater than 50 percent (either above or below 4.5 feet), are considered Item 8.5.1.10, STANDING DEAD (CORE 5.7.2) and are included in the CWD inventory (see discussion and diagrams in Item 8.5.1.10, STANDING DEAD (CORE 5.7.2)). For multi-stemmed woodland species (Appendix D) such as juniper, only tally stems that are dead and detached. Include as CWD all dead multi-stemmed woodland tree stems that do not qualify as standing dead if they meet the size requirements for CWD pieces. Also included are non-machine processed round wood such as fence posts and cabin logs.

CWD is measured primarily using intersect diameter. In rare instances when pieces are in a pile and it is impossible to estimate the size of individual pieces, use the pile protocol.

CWD does not include:

1. Woody pieces <3.0 inches in diameter at the point of intersection with the transect.
2. Dead trees leaning 0 to 45 degrees from vertical (see discussion and diagrams in Item 8.5.1.10, STANDING DEAD (CORE 5.7.2)).
3. Dead shrubs, self-supported by their roots.
4. Trees showing any sign of life.
5. Stumps that are rooted in the ground (i.e., not uprooted).
6. Dead foliage, bark or other non-woody pieces that are not an integral part of a bole or limb. (Bark attached to a portion of a piece is an integral part).
7. Roots or main bole below the root collar.

Fine Woody Debris – In this inventory, FWD includes downed, dead branches, twigs, and small tree or shrub boles <3 inches in diameter that are not attached to a living or standing dead source. FWD can be connected to a larger branch, as long as this branch is on the ground and not connected to a standing dead or live tree. Only the woody branches, twigs, and fragments that intersect the transect are counted. FWD can be connected to a down, dead tree bole or down, dead shrub. FWD can be twigs from shrubs and vines. FWD must be no higher than 6 feet above the ground to be counted.

FWD does not include:

1. Woody pieces ≥3.0 inches in diameter at the point of intersection with the transect.
2. Dead branches connected to a live tree or shrub; or to a standing dead tree or dead shrub.
3. Dead foliage (i.e., pine or fir needles, or leaf petioles).
4. Bark fragments or other non-woody pieces that are not an integral part of a branch, twig, or small bole.
5. Small pieces of decomposed wood (i.e., chunks of cubical rot)
6. Roots or main bole below the root collar

SECTION 11.3 LOCATING AND ESTABLISHING LINE TRANSECTS

Transects are established on each subplot if the subplot center is accessible (i.e., not census water, access denied, or hazardous), and there is at least one forest or measured nonforest land condition class mapped within the 24.0-foot radius subplot (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2). Transects begin at the subplot center and extend 24.0 feet to the edge of the subplot. The location of condition class boundaries is recorded along the transect, starting at the subplot center and working towards the fixed radius plot boundary. It is extremely important to lay out the transect in a straight line to avoid biasing the selection of pieces and to allow the remeasurement of transect lines and tally pieces for QA purposes.

Transect lines should be marked with a small piece of flagging at the end of the line (24.0 feet, horizontal distance) to help the QA staff identify the path of the transect during the check-plot procedure. Because the tolerance for the transect azimuth is +/- 2 degrees, the line might have been laid down in a slightly different direction from the check-plot crew. This could affect the location of diameter measurements for CWD pieces as well as identifying whether a CWD piece is a valid tally piece. It is also helpful to mark the point where the FWD transect begins (14 feet, horizontal distance).

SUBSECTION 11.3.1 CWD TRANSECTS

Two transects are established that originate at the subplot center and extend out 24.0 feet horizontal distance (the radius of the subplot) (Figure 11.1).

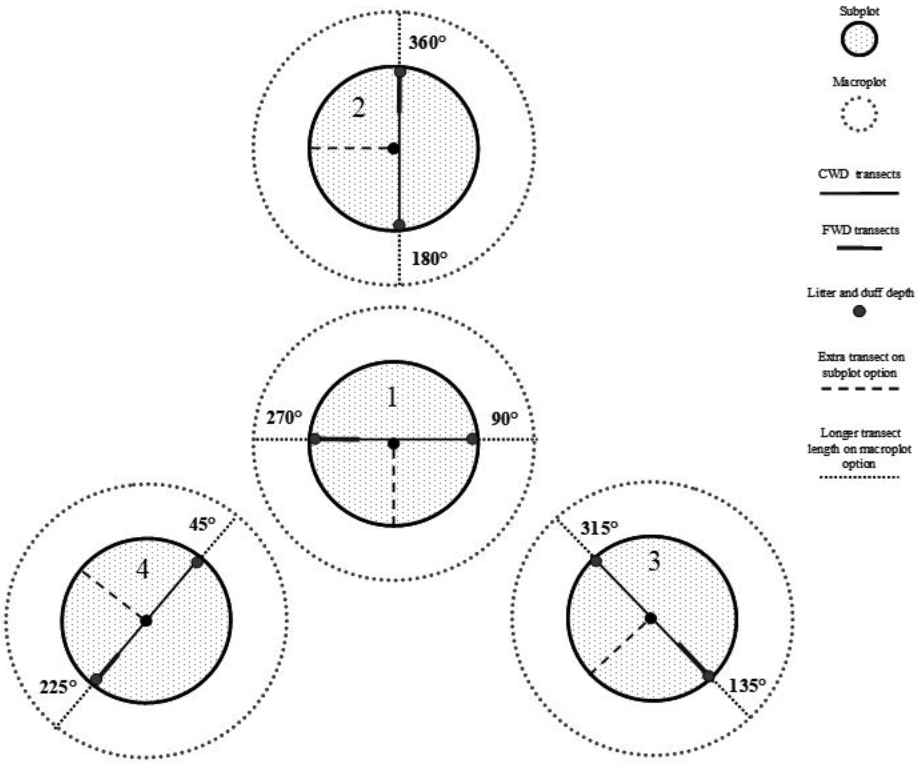


Figure 11.1: Plot layout for sampling CWD, FWD, and litter and duff depth. CWD transects include two 24-foot transects per subplot (starting at subplot center designated by its azimuth as labeled).

SUBSECTION 11.3.2 FWD TRANSECTS

On a portion of one CWD transect on each subplot, FWD is tallied within 3 size classes. Because FWD is generally present in high densities, a shorter transect will pick up an acceptable amount of tally. The transect begins at 14 feet (horizontal distance) from the subplot center and extends out either 6 or 10 feet (horizontal distance) depending on the FWD size class, as follows:

Category of FWD	Size Class	Diameter range	Transect length (horizontal distance)	Transect location (horizontal distance)
Small FWD	1	0 in to 0.24 in	6 feet	14 to 20 feet
Medium FWD	2	0.25 in to 0.9 in	6 feet	14 to 20 feet
Large FWD	3	1.0 in to 2.9 in	10 feet	14 to 24 feet

It is helpful to have a size gauge available until your eye is 'trained' to recognize the 3 FWD size classes. Examples include a plastic or cardboard card with 3 notches cut for each size class, or a set of 3 dowels representing each size class.

SECTION 11.4 PLOT-LEVEL VARIABLES FOR DWM PROTOCOL

The codes in this section define the type of variables and transect configuration used for measuring DWM.

Item 11.4.0.1 DWM NUMBER OF SUBPLOTS (BASE 1.25.2)

[PLOT.P2DWM_NBR_SUBP]

A downloaded variable identifying the number of subplots on which DWM is measured. When DWM SAMPLING STATUS = 1 or 2, number of subplots = 4.

When collected:	All plots where DWM SAMPLING STATUS >0
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 4

Item 11.4.0.2 DWM NUMBER OF TRANSECTS ON SUBPLOT (BASE 1.25.3)

[PLOT.P2DWM_NBR_SUBP_TRANSECT]

A downloaded variable identifying the number of transects per subplot on which DWM is measured. A "transect" is defined as a line starting from subplot center and ending at or beyond the subplot boundary. When DWM SAMPLING STATUS = 1, number of transects per subplot = 2.

When collected:	All plots where DWM SAMPLING STATUS >0
Field width:	1 digit
Tolerance:	No errors
Values:	2

Item 11.4.0.3 DWM TRANSECT LENGTH (BASE 1.25.4)

[PLOT.P2DWM_TRANSECT_LENGTH]

A downloaded variable identifying the length of each transect on which DWM is measured. The transect length when DWM SAMPLING STATUS >0 is 24.0 feet, measured to the nearest 0.1 foot.

When collected:	All plots where DWM SAMPLING STATUS >0
Field width:	3 digits (xx.y)
Tolerance:	+/- 1 ft
Values:	24.0

Item 11.4.0.4 DWM NOTES (BASE 1.26.6)

[PLOT.NOTES]

Use these fields to record notes pertaining to the Down Woody Materials indicator. If the notes apply only to a specific subplot or other specific aspect of the plot, then make that clear in the notes.

When collected:	All plots where DWM SAMPLING STATUS >0, as needed
Field width:	Unlimited alphanumeric character field
Tolerance:	N/A
Values:	English language words, phrases and numbers

SECTION 11.5 TRANSECT LINE SEGMENTING

Transect lines are segmented to determine the length of transect that occurs within each mapped condition class intersecting the line. These lengths determine the expansion factors for the measured DWM. It is important that any changes or corrections to condition identity, location and size mapped on the subplot spatially match the segmentation done on the transects. A segment is a length of transect that is in one condition. Segments are identified by recording the BEGINNING DISTANCE and ENDING DISTANCE from subplot center towards the end of the transect.

If any part of the transect segment is in a measured condition but the CWD is not measurable (e.g., snow or water), do not measure any DWM (CWD, FWD, or duff/litter depth) on that transect segment and set DWM TRANSECT SEGMENT SAMPLE STATUS = 0.

Starting at the subplot center and working towards the fixed radius plot boundary, each segment of transect line in a different condition class is delineated and recorded as a separate record. The horizontal BEGINNING DISTANCE and ENDING DISTANCE are recorded for each condition class encountered (Figure 11.2). The first record for each transect will have a BEGINNING DISTANCE of 0 feet. If only one condition class occurs on the transect line, only one segment is recorded. The last segment on all transects must have an ENDING DISTANCE of 24.0 feet horizontal distance if sampling the subplot. All condition segments on the transect must be defined and all transect length recorded and accounted for, either by condition, or by DWM TRANSECT SEGMENT SAMPLE STATUS.

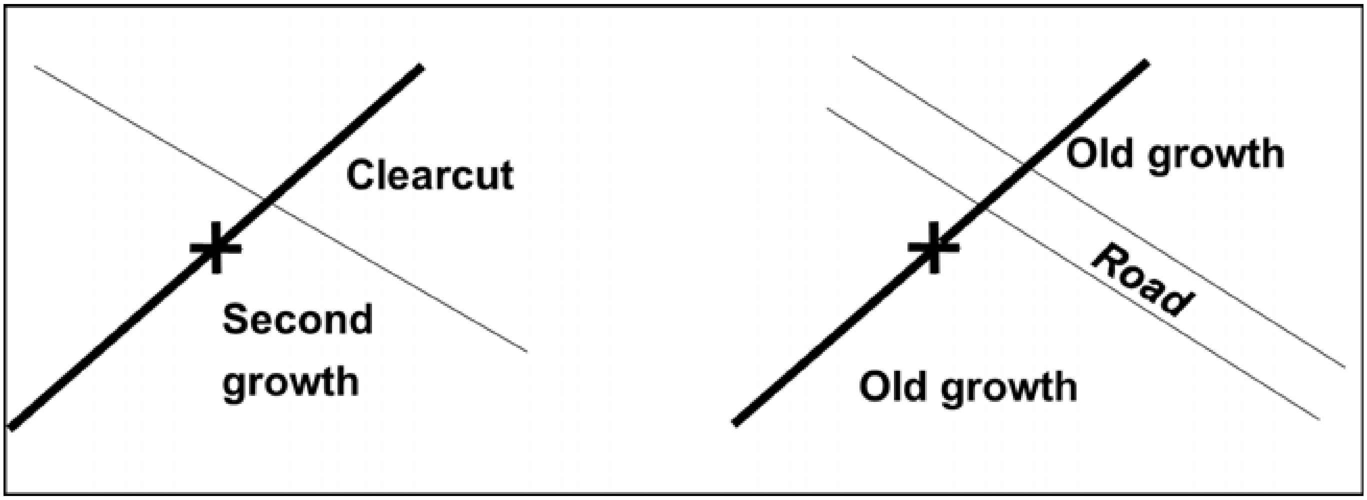


Figure 11.2: Transects are installed across condition class boundaries.

Item 11.5.0.1 SUBPLOT NUMBER (BASE 10.3.1)
[P2DWM_TRANSECT_SEGMENT.SUBP]

Record the code indicating the subplot center from which the transect originates.

When collected:	All transect segments on plots where DWM SAMPLING STATUS >0	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 11.5.0.2 TRANSECT (BASE 10.3.2)
[P2DWM_TRANSECT_SEGMENT.TRANSECT]

Record the transect azimuth (degrees) on which a condition class is being delineated. These transects, when being installed, have a tolerance of +/- 2 degrees.

When collected:	All transect segments where DWM SAMPLING STATUS > 0	
Field width:	3 digits	
Tolerance:	No errors	
Values:	Subplot	Transect direction (degrees) from center of subplot
	1	090
		270
	2	360
		180
	3	135
		315
	4	045
		225

Item 11.5.0.3 SEGMENT NUMBER (PNW)
[P2DWM_TRANSECT_SEGMENT.SEGMT]

A generated number to identify each segment length contained within one condition class; numbering begins at plot center and works out to the plot perimeter.

When collected:	All transect segments in all condition classes
Field width:	1 digit
Tolerance:	No errors
Values:	1-9

Item 11.5.0.4 SEGMENT CONDITION CLASS NUMBER (BASE 10.3.3)
[P2DWM_TRANSECT_SEGMENT.CONDID]

Record the code indicating the number of the condition class for the transect segment. Use the same code assigned to the condition class on the subplot or elsewhere on the plot. The first segment recorded for each transect will have the same CONDITION CLASS NUMBER as assigned to the subplot center.

When collected:	All transect segments where DWM SAMPLING STATUS >0
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 11.5.0.5 SEGMENT BEGINNING DISTANCE (BASE 10.3.4)
[P2DWM_TRANSECT_SEGMENT.BEGINHORIZDIST]

Record the location (using horizontal distance to nearest 0.1 foot) on the transect line where the transect intersects the boundary with the adjacent condition class nearer to the subplot center. The first record for each transect will have a BEGINNING DISTANCE of 0 ft. Each subsequent record will have a BEGINNING DISTANCE equal to the ENDING DISTANCE of the previous record.

When collected:	All transect segments where DWM SAMPLING STATUS >0
Field width:	3 digits (xx.y)
Tolerance:	+/- 1 ft
Values:	00.0 to *24.0* horizontal feet

Item 11.5.0.6 SEGMENT ENDING DISTANCE (BASE 10.3.5)
[P2DWM_TRANSECT_SEGMENT.ENDHORIZDIST]

Record the location (using horizontal distance to nearest 0.1 foot) on the transect line where the transect exits the condition class being delineated and intersects the boundary with a different condition class further away from the subplot center. If no other condition classes are encountered, record the location (using horizontal distance) of the end of the transect line.

When collected:	All transect segments where DWM SAMPLING STATUS >0
Field width:	3 digits (xx.y)
Tolerance:	+/- 1 ft
Values:	00.1 to *24.0* horizontal feet

Item 11.5.0.7 DWM TRANSECT SEGMENT SAMPLE STATUS (BASE 10.3.6)
[P2DWM_TRANSECT_SEGMENT.SEGMNT_STATUS_CD]

Record the sample status for the transect segment. If any part of the segment is in an accessible condition that would be measured (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2), but the CWD is not measurable due to an obstruction such as snow or water, do not measure DWM on any part of the transect segment, and set code to 0 for that segment. In all other situations, set the code to 1. Conditions on which DWM would not be measured regardless (CONDITION CLASS STATUS = 3 or NONFOREST CONDITION CLASS STATUS = *5*), will automatically be coded 1; those conditions should be identified in the transect segmenting.

When collected:	All transect segments on plots where DWM SAMPLING STATUS >0	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	Transect segment not sampled
	1	Transect segment sampled

Item 11.5.0.8 DWM TRANSECT SEGMENT NONSAMPLED REASON (BASE 10.3.7)
[P2DWM_TRANSECT_SEGMENT.SEGMNT_NONSAMPLE_REASN_CD]

Record the reason that DWM cannot be measured on the transect.

When collected:	All transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 0	
Field width:	2 digits	
Tolerance:	No errors	
Values:	05	Lost data (office use only)
	10	Other (for example, snow or water covering CWD that is supposed to be sampled). *DWM NOTE required when using this code.*

SECTION 11.6 SAMPLING METHODS FOR COARSE WOODY DEBRIS (CWD)

SUBSECTION 11.6.1 TALLY RULES FOR COARSE WOODY DEBRIS (CWD)

1. Coarse woody debris (CWD) is sampled on accessible forest conditions, and on accessible, *measurable* nonforest conditions (i.e., NONFOREST CONDITION CLASS STATUS = 2). Tally CWD by starting at the subplot center and working towards the fixed radius plot boundary. Measurements should **not** be taken along transects moving inward toward subplot center. Tally a piece if its central longitudinal axis intersects the transect, and the condition class is measured at the point of intersection (Figure 11.3). The entire piece is assigned to this condition.

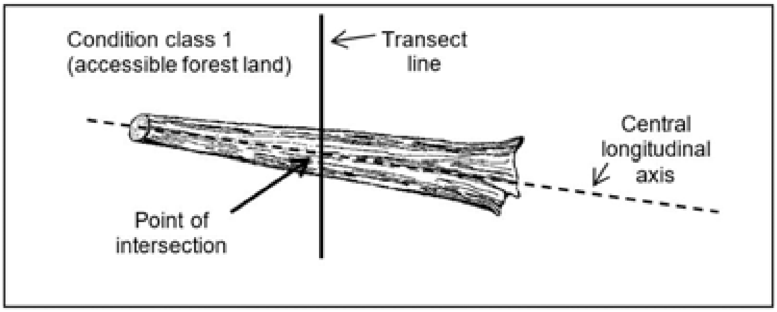


Figure 11.3: Tally rules for CWD.

2. Tally dead trees and tall stumps that are leaning > 45 degrees from vertical. Do not tally live trees or standing dead trees and tall stumps that are still upright and leaning < 45 degrees from vertical. Follow the same rules for down trees as outlined in Section 8.1, Definitions for determining what qualifies as standing and down dead trees and portions/tops of trees. Most CWD will be laying on the ground.

   Note: In order to avoid double counting or totally missing trees or portions in either protocol, once a decision is made on whether a tree or portion/top of a tree is considered standing or down it is important to include it in either one or the other protocol (standing tree or CWD), but not both. See additional diagrams in Item 8.5.1.10, STANDING DEAD (CORE 5.7.2).

3. The minimum length for any tally piece is 0.5 feet and it needs to meet the minimum transect diameter guidelines.
4. Decay class of the piece determines whether or not the piece is tallied (see Item 11.7.0.8).

   For decay classes 1 to 4: tally a piece if it is ≥3.0 inches in diameter at the point of intersection with the transect (Figure 11.4).

   For decay class 5: tally a piece if it is ≥5.0 inches in diameter at the point of intersection and ≥5.0 inches high from the uphill side of the ground. The reason for treating decay class 5 pieces differently is because they are difficult to identify, especially when heavily decomposed. Only pieces that still have some shape and log form are tallied—humps of decomposed wood that are becoming part of the duff layer are not tallied.

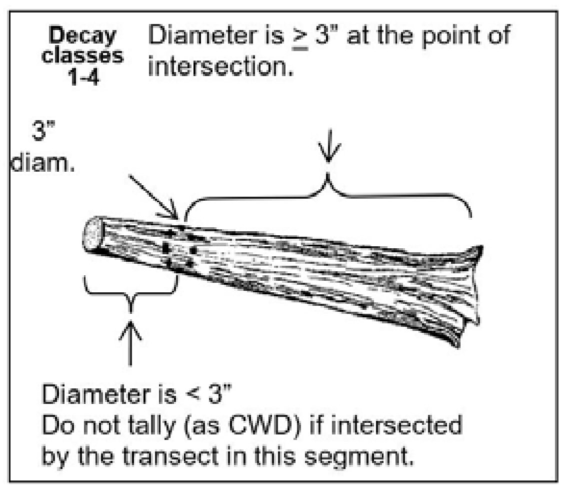


Figure 11.4: Tally rules for CWD decay classes 1-4.

5. Tally pieces created by natural causes (examples: natural breakage or uprooting) or by human activities such as cutting. In some cases it may be impossible to measure or estimate individual pieces—for example when CWD pieces are in machine-piled slash piles or windrows, or are part of a jumble from flooding, landslide or avalanche. In these situations, piles are described using the instructions in Section 11.7, Sampling Residue Piles.. Because biomass estimates from piles have great uncertainty associated with them, pieces should be measured individually if at all possible.
6. Tally a piece only if the point of intersection occurs above the ground. If one end of a piece is buried in the litter, duff, or mineral soil, the piece ends at the point where it is no longer visible. Measure the diameter and length at this point.

7. If the central longitudinal axis of a piece is intersected more than once on a transect line or if it is intersected by two transect lines, tally the piece each time it is intersected (uncommon situation, see Figure 11.5).

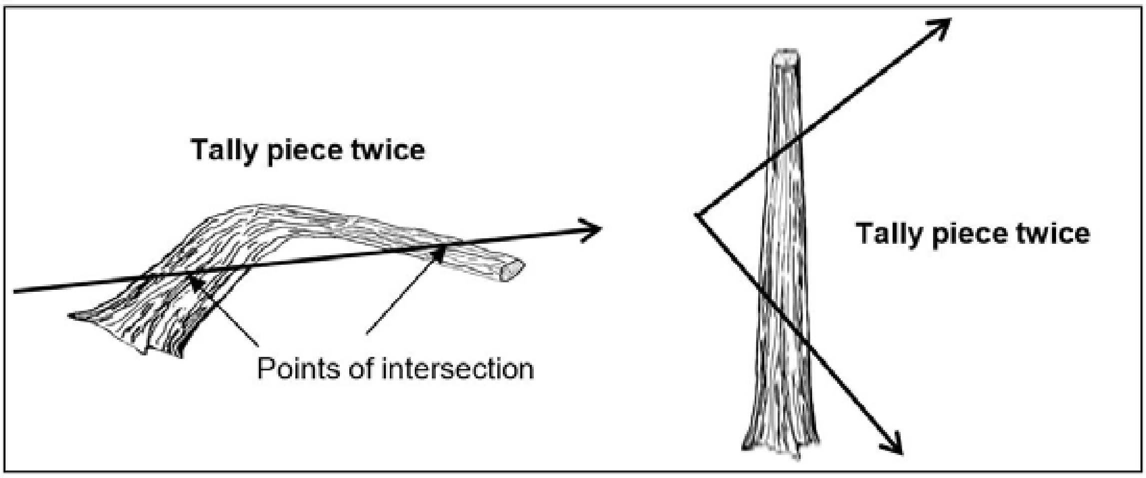


Figure 11.5: CWD tally rules: intersections.

8. Tally a piece only once if the subplot center falls directly on the central longitudinal axis of the piece. Tally the piece on the smallest azimuth degree transect.
9. If a piece is fractured across its diameter or length, and would pull apart at the fracture if pulled from either end or sides, treat it as two separate pieces. If judged that it would not pull apart, tally as one piece. Tally only the piece intersected by the transect line.
10. Do not tally a piece if it intersects the transect on the root side of the root collar. Do not tally roots.
11. When the transect crosses a forked down tree bole or large branch connected to a down tree, tally each qualifying piece separately. To be tallied, each individual piece must meet the minimum diameter requirements.
12. In the case of forked trees, consider the "main bole" to be the piece with the largest diameter at the fork. Variables for this fork such as TOTAL LENGTH and DECAY CLASS should pertain to the entire main bole. For smaller forks or branches connected to a main bole (even if the main bole is not a tally piece), variables pertain only to that portion of the piece up to the point where it attaches to the main bole (see Figure 11.6).
13. If a transect intersects a non-measured condition (e.g., a road when NONFOREST CONDITION CLASS STATUS = 5, or an inaccessible condition class, or a non-sampled code for CWD), CWD is not tallied.

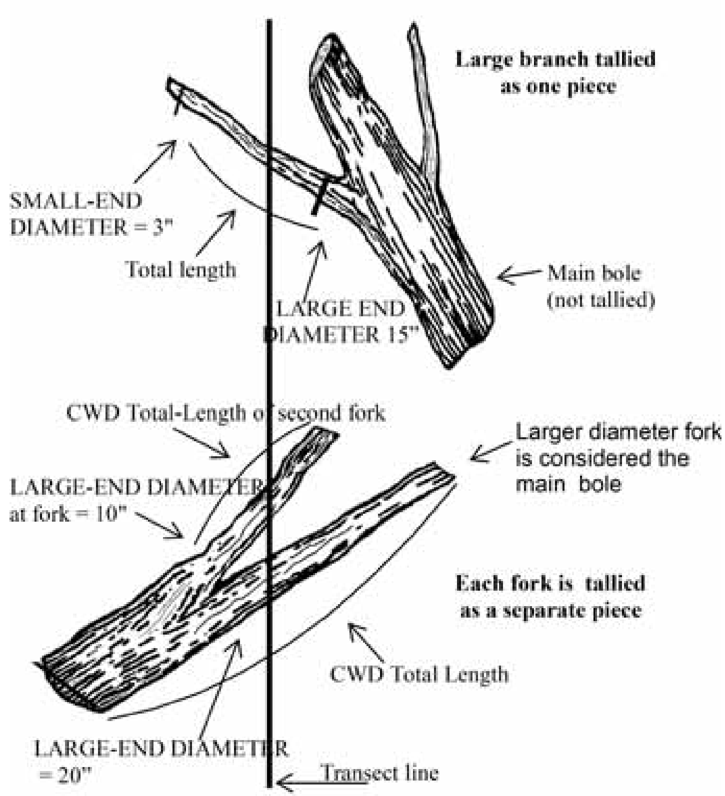


Figure 11.6: CWD tally rules for forked trees.

SUBSECTION 11.6.2 MARKING CWD

Marking CWD is highly recommended if allowed by the land owner, a wax crayon is a good option. Marked CWD is an aid to future crews returning to the plot for a QA check.

SUBSECTION 11.6.3 RECORDING PROCEDURES FOR CWD

The tolerance for the total number of pieces (≥3 inches, transect diameter) tallied across all transects on the plot is: +/- 1 piece for the plot.

Item 11.6.3.1 SUBPLOT NUMBER (BASE 10.4.3.1)
[P2DWM_CWD.SUBP]

Record the code indicating the number of the subplot center from which the transect originates.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 11.6.3.2 COARSE WOODY DEBRIS ID (PNW)
[P2DWM_CWD.CWDID]

This is a 4-digit code, assigned by the PDR, to uniquely and permanently identify each piece of CWD on a transect.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1, **or** NONFOREST CONDITION CLASS STATUS = 2
Field width:	4 digits
Tolerance:	No errors
Values:	1-9999

Item 11.6.3.3 TRANSECT (BASE 10.4.3.2)
[P2DWM_CWD.TRANSECT]

Record the azimuth of the transect on which the CWD piece is sampled.

When collected:	All tally pieces where DWM TRANSECT SAMPLE STATUS = 1	
Field width:	3 digits	
Tolerance:	No errors	
Values:	Subplot	Transect direction (degrees) from center of subplot
	1	090
		270
	2	360
		180
	3	135
		315
	4	045
		225

Item 11.6.3.4 CWD CONDITION CLASS (BASE 10.4.3.3)
[P2DWM_CWD.CONDID]

Record the condition class number for each CWD piece at the point where the central longitudinal axis of the piece intersects the transect. If there is only one condition on the plot all CWD pieces will be assigned to CWD condition class = 1. If more than one condition has been identified and/or mapped on the plot/subplot, record the appropriate condition based on the location of the transect diameter measurement. All CWD pieces require a condition class and only classes that have been identified and/or mapped are valid.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 11.6.3.5 PIECE ON SUBPLOT OR ANNULAR PLOT? (BASE 10.4.3.4)
[P2DWM_CWD.ONSUBP_ANNPCD]

Identify whether point of transect intersection with piece is on the subplot. All pieces will be assigned code = 1.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Central longitudinal axis of piece intersects the transect on the subplot (≤24.0 horizontal feet)
	2	Central longitudinal axis of piece intersects the transect on the macroplot (24.1 – 58.9 horizontal feet)

Item 11.6.3.6 CWD SLOPE DISTANCE (PNW)
[P2DWM_CWD.SLOPDIST_PNWRS]

Record the code indicating the slope distance from the subplot center to the point where the transect intersects the longitudinal center of the piece. If two or more pieces have the same slope distances, record the top piece first. Measure and record to the nearest 0.1 feet. CWD SLOPE DISTANCE is used to locate the piece for QA purposes.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1, **or** NONFOREST CONDITION CLASS STATUS = 2
Field width:	3 digits
Tolerance:	+/- 1.0 feet
Values:	00.1 to 99.9

Item 11.6.3.7 CWD DECAY CLASS (BASE 10.4.3.6)
[P2DWM_CWD.DECAYCD]

Record a 1-digit code indicating the decay class of the piece. Code the decay class that predominates along the observed length of the piece. Use the guide below to determine CWD DECAY CLASS.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	1 digit
Tolerance:	+/- 1 class
Values:	

Decay Class	Structural Integrity	Texture of Rotten Portions	Color of Wood	Invading Roots	Branches and Twigs
1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish-brown or original color	Sapwood only	Branch stubs will not pull out
4	Heartwood rotten; piece does not support its own weight, but maintains it shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Through-out	Branch stubs pull out
5	None, piece no longer maintains its shape, it spreads out on ground	Soft; powdery when dry	Red-brown to dark brown	Through-out	Branch stubs and pitch pockets have usually rotted down

Note: CWD DECAY CLASS 5 pieces can be difficult to identify because they often blend into the duff and litter layers. They must still resemble a log; therefore, the first tally rule is that they must be ≥5.0 inches in diameter and ≥5.0 inches from the surface of the ground. Decomposed logs that are slightly elevated 'humps' on the ground are not tallied.

CWD DECAY CLASS: The chart above was developed primarily for Douglas-fir in the Pacific Northwest. At the present time, there are no other charts available to use to describe decay classes for other species or locations. Concentrate on the structural integrity and texture when estimating a decay class for CWD logs.

If a log is case hardened (hard, intact outer sapwood shell) but the heartwood is rotten, code this log as a CWD DECAY CLASS 2. CWD DECAY CLASS 1 should be reserved for 'freshly fallen' logs that are completely intact (i.e., recent windfalls, or harvest).

Item 11.6.3.8 SPECIES (BASE 10.4.3.7)
[P2DWM_CWD.SPCD]

Record the code indicating the species of the piece. Since CWD pieces are not necessarily always tally species, record the most detailed available species code based on the NFS or Island sub-list associated with the area in which the plot is located (see Appendix D). For shrubs or vines enter *code 0001*,.

Species identification may difficult or uncertain for some pieces. Compare such piece's characteristics to that of other species found in the area to assign the most appropriate species to the piece. The piece's bark (either attached or sloughed and lying beside the piece), branching pattern (if the branches are still present), or heartwood smell (particularly if cedars, Douglas-fir, or western hemlock) may provide clues. On remeasurement plots, see what tree species were tallied in past inventories. One way to distinguish hardwoods from softwoods is by the type of decay present. Hardwoods usually have a white or grayish stringy rot, while softwoods usually have a reddish-brown blocky rot. If it is not possible to identify the species, attempt to estimate if it is softwood or hardwood. Enter code 0299 for unknown dead conifer or 0998 for unknown dead hardwood. Note: Codes 0299 and 0998 are **not valid** when CWD DECAY CLASS = 1, 2 or 3.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4	
Field width:	4 digits	
Tolerance:	No errors	
Values:	Code	Core code (office use only)
	0299, 0998, species codes in Appendix D	
	0001 - shrub or vine	0998

SUBSECTION 11.6.4 DIAMETERS

If possible, the best way to measure diameter is to wrap the tape perpendicular to the longitudinal axis at the point of transect intersection (Figure 11.7). If that is not possible it is useful to carry a steel carpenters retracting tape to measure diameters. Other methods include wrapping a tape around the bole if possible, holding a straight-edge ruler above the piece, or using calipers.

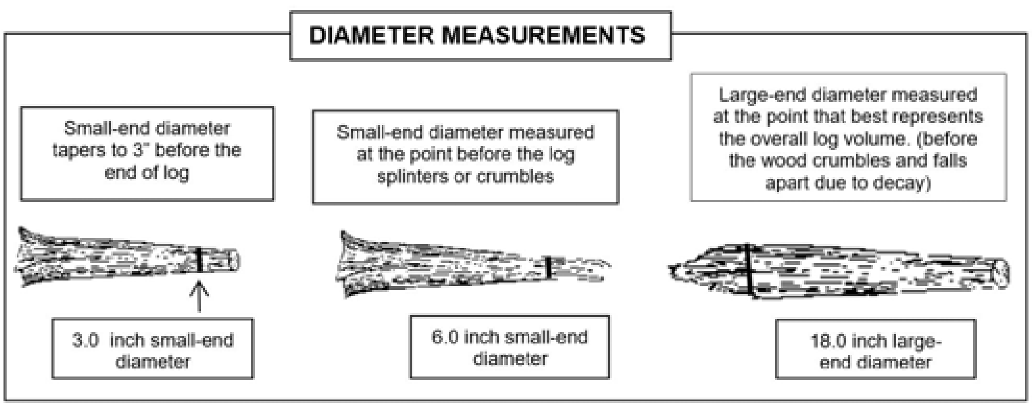


Figure 11.7: Diameter measurements

For pieces that cannot be taped and are not round in cross-section because of missing chunks of wood or "settling" due to decay, measure the diameter in two directions and take an average. Estimate the longest and shortest axis of the cross-section ("A" and "B" in Figure 11.8), and enter the average in the diameter field. This technique applies to intersect, small-end, and large-end diameters.

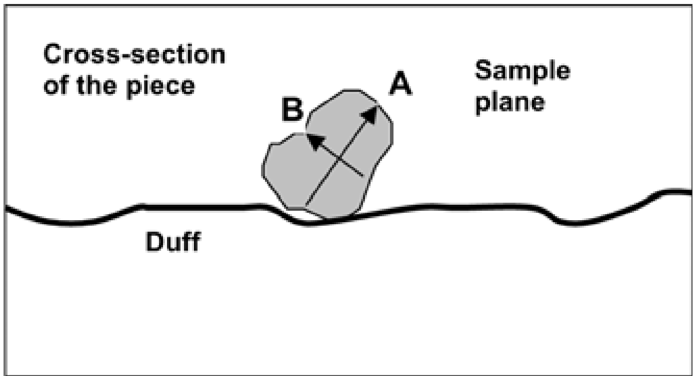


Figure 11.8: Estimating the diameter of pieces that are not round in cross-section.

If the transect intersects the log at the decayed or splintered end (Figure 11.9), record the diameter at this location as the intersect diameter. Record the large end and small end diameters on the same side of the transect diameter as illustrated. Record the small end diameter as 3 inches if it tapers below 3 inches. If the splintered end appears to be two separate pieces (i.e., a major split located just at the end) – in this situation treat it as one log and take a diameter around the end (take two measurements if it is odd shaped.

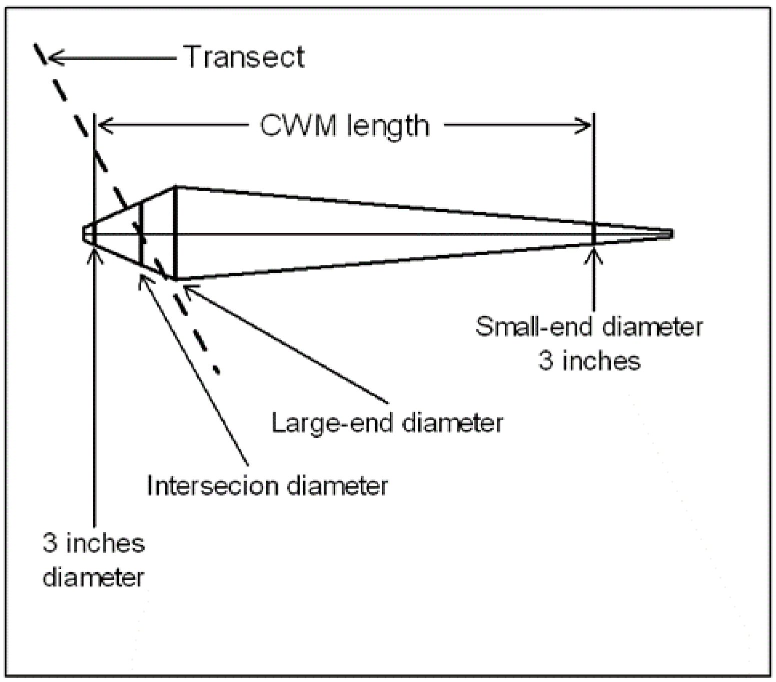


Figure 11.9: Example of decayed end intersecting the transect

Item 11.6.4.1 DIAMETER AT POINT OF INTERSECTION (BASE 10.4.3.8.1)
[P2DWM_CWD.TRANSECT_DIA]

Record the piece's diameter at the point where the transect intersects the longitudinal center of the piece. Record the diameter to the nearest inch. If the diameter is close to 3 inches, measure the diameter to the nearest 0.1 inch to determine if the piece is actually ≥3.0 inches and a valid tally piece.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	3 digits
Tolerance:	Pieces <20.0 inches diameter: +/- 1 inch for decay class 1-4, +/- 2 inches for decay class 5 Pieces ≥20.0 inches diameter (decay classes 1-4): +/- 2 inches for each 20-inch increment >20.0 inches Pieces ≥20.0 inches diameter (decay class 5): +/- 3 inches for each 20-inch increment above 20.0 inches
Values:	003 to 200 inches

Item 11.6.4.2 DIAMETER OF HOLLOW AT POINT OF INTERSECTION (BASE 10.4.3.8.2)
[P2DWM_CWD.HOLLOW_DIA]

Record the diameter of hollow at the point of intersection. This variable contributes to reducing bias in biomass estimate and only applies to the point of intersection. If it can be ascertained that the piece is hollow at the transect diameter location, measure or estimate the diameter of hollow to the nearest inch, otherwise record as 0. Diameter of hollow must be less than the transect diameter. Note: Record a hollow diameter only when it is obvious that a piece is hollow at the point of intersection (a hole or crack in the piece, evidence of hollow as observed from the end, etc.). Unlike Item 11.6.5.2, there is no hollow size requirement for this variable.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4
Field width:	3 digits
Tolerance:	Pieces < 20.0 inches diameter: +/- 1 inch Pieces ≥20.0 inches diameter: +/- 2 inches for each 20-inch increment above 20.0 inches
Values:	000, 001 to 200 inches

SUBSECTION 11.6.5 LENGTH MEASUREMENTS

Measure the length of the piece (to the nearest foot) along its centerline, either to the end of the piece or to the point where the diameter reaches 3 inches. If the piece tapers at both sides, due to decay or breakage, the length is measured for the 3-inch diameter cutoff at both ends, regardless of where the large end-diameter may be (see Figure 11.9). No length is recorded for pieces <3 feet long.

Item 11.6.5.1 CWD LENGTH ≥3 FEET (BASE 10.4.3.9.1)
[P2DWM_CWD.LENGTH_3FTCD]

Record the code that indicates whether the CWD TOTAL LENGTH is less than 3 feet long (and at least 0.5 foot long). Distinguish length orientation by direction of the pith. Note: the diameter of a small piece may be larger than its length.

When collected:	All tally pieces >0.5 foot long, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No error	
Values:	1	CWD TOTAL LENGTH ≥3 feet
	2	CWD TOTAL LENGTH ≥0.5 foot and <3 feet

Item 11.6.5.2 IS THE PIECE HOLLOW? (OPTIONAL 10.4.3.10)
[P2DWM_CWD.HOLLOWCD]

Record the code indicating whether or not the piece is hollow (see Figure 11.10). The cavity does not need to cross the transect, and may be present anywhere along the length of the piece to qualify. This definition of hollow is different from the definition used in Item 11.6.4.2 DIAMETER OF HOLLOW AT POINT OF INTERSECTION. This variable provides information for wildlife assessment.

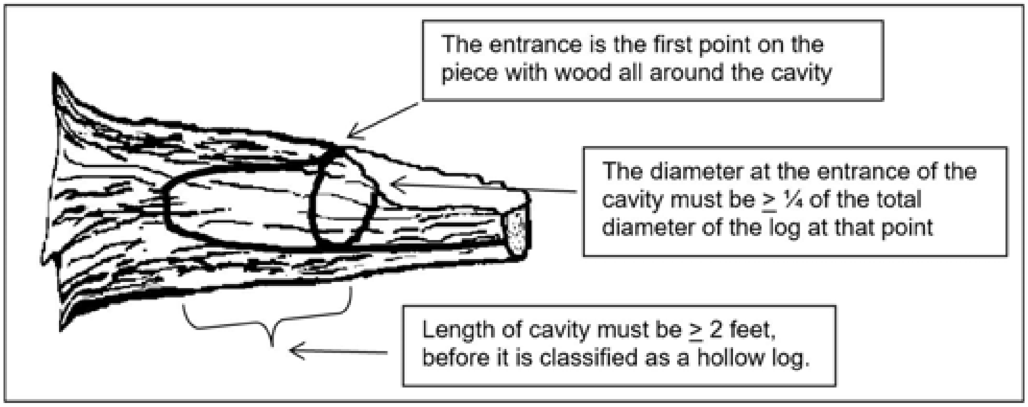


Figure 11.10: Determining if the piece is hollow.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4 and CWD LENGTH ≥ 3 FEET = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	Does not meet criteria for being a hollow log
	1	A piece is considered hollow if a cavity extends at least 2 feet along the central longitudinal axis of the piece, and the diameter of the entrance to the cavity is at least 1/4 of the diameter of the piece where the entrance occurs. The entrance occurs at the point where the circumference of the cavity is whole -- the point where wood is present completely around the circumference of the cavity. The length of the cavity begins at this point. This definition of hollow is different from the definition used in Item 11.6.4.2 DIAMETER OF HOLLOW AT POINT OF INTERSECTION.

Item 11.6.5.3 PIECE INCLINATION (OPTIONAL 10.4.3.11)
[P2DWM_CWD.INCLINATION]

Record the inclination from horizontal of the piece in degrees. Measure the inclination with a clinometer. Inclination from horizontal should be estimated rapidly by setting a clinometer along the top of the log, adjusting if necessary to match the angle between the location of the large end diameter and the location of the small end diameter, and reading the inclination from the face of the clinometer in degrees.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	2 digits
Tolerance:	+/- 5 degrees
Values:	00 to 90 degrees

Item 11.6.5.4 CWD HISTORY (OPTIONAL 10.4.3.12)
[P2DWM_CWD.CWDHISTCD]

Record the code that indicates whether or not the piece of CWD is on the ground as a result of harvesting operations or as a result of natural circumstances. One objective of this item is to identify those pieces that are considered logging residue. If the piece appears to have fallen to the ground as a result of natural causes such as decomposition or windfall, enter a code of 1. This category would include blown out tops, snapped off boles, wind-fallen trees on clearcut edges, and trees that basically collapsed and fell over due to decomposition.

If the piece is on the ground as a result of recent (since last annual remeasurement; if the plot is new, the time between the panel remeasurements) harvesting activity, either because the tree was cut down with a chainsaw (or other device) or pushed over by harvesting equipment (bulldozer), enter a code of 2. A code of 2 would be considered logging residue (usually you are in the middle of a recent clearcut).

If the piece is on the ground as a result of older (more than 15 years) harvesting activity, enter a code of 3. This would be a situation where you tally an old decomposing log that has a sawn end – if it appears that the log was cut and left on site, then enter a code of "3".

If a piece is on the ground as a result of incidental harvest (such as a standing tree was cut for firewood or small clearing), enter a code of "4". Incidental harvest involves a few trees and is not a part of a major organized harvesting operation.

If the crew cannot decide the history of the CWD log, classify it as "unknown", and give it a code of "5".

When Collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	CWD piece is on the ground as a result of natural causes
	2	CWD piece is on the ground as a result of major recent harvest activity (≤ 15 yrs old)
	3	CWD piece is on the ground as a result of older harvest activity (> 15 yrs old)
	4	CWD piece is on the ground as a result of an incidental harvest (such as firewood cutting)
	5	Exact Reason Unknown

Item 11.6.5.5 PERCENT OF LOG CHARRED BY FIRE (OPTIONAL 10.4.3.13)
[P2DWM_CWD.CHARCD]

Record a code that represents the percentage of the log's surface area that has been charred by fire. Only examine the visible surface of the log. These data will be used by wildlife biologists to determine the impact fire has had on wildlife habitat. Wildlife tend to avoid charred logs because fire seals the wood making it slow to rot and hard to excavate.

When collected:	All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1, DIAMETER AT POINT OF INTERSECTION >20, and CWD DECAY CLASS = 1 to 3	
Field width:	1 digit	
Tolerance:	+/- 1 class	
Values:	0	None of the log is charred by fire
	1	Up to 1/3 of the log is charred by fire
	2	1/3 to 2/3 of the log is charred by fire
	3	2/3 or more of the log is charred by fire

Item 11.6.5.6 COARSE WOODY DEBRIS NOTES (AFSL, PFSL)
[P2DWM_CWD.NOTES]

Record any notes needed to clarify or explain a special situation encountered with a piece of CWD.

When collected:	All plots: as needed
Field width:	40 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

SECTION 11.7 SAMPLING RESIDUE PILES

A pile is an accumulation of large woody material in which individual pieces are impossible to tally separately. Piles may be created by human activity or natural causes. However, loose piles created by windthrow, landslides, fires or other natural causes, or by thinning or logging operations, should be tallied using the regular CWD protocols unless it is physically impossible to separate individual pieces. The pile protocol should only be used as a last resort, when the regular CWD protocols cannot be used.

Piles are tallied only if intersected by a transect and located in an accessible forest condition class (CONDITION CLASS STATUS = 1) or *an accessible*, measurable nonforest condition (NONFOREST CONDITION CLASS STATUS = 2). An estimate of the length and depth of the pile, species composition and decay class are recorded:

1. Tally individual pieces along the transect until it is not possible to measure them separately and record the horizontal transect distance to this point. Then, record the horizontal transect distance to the point where individual pieces can again be tallied separately (see Figure 11.11).
2. If the pile straddles two condition classes, assign it to the condition class that is closest to subplot center along the transect.
3. Estimate the average height of the pile along the transect. Visually compact the pile to estimate the height of wood, excluding air, rocks, debris and pieces of wood less than 3 inches in diameter at the plane of intersection with the transect. There is a tendency to overestimate the proportion of the cross-section of the pile made of wood. Note that when packing perfect circles of equal diameter, the maximum attainable packing ratio is less than 90% (see Figure 11.12).
4. Record the predominant species in the pile.
5. Record the predominant decay class of the pieces in the pile.

.

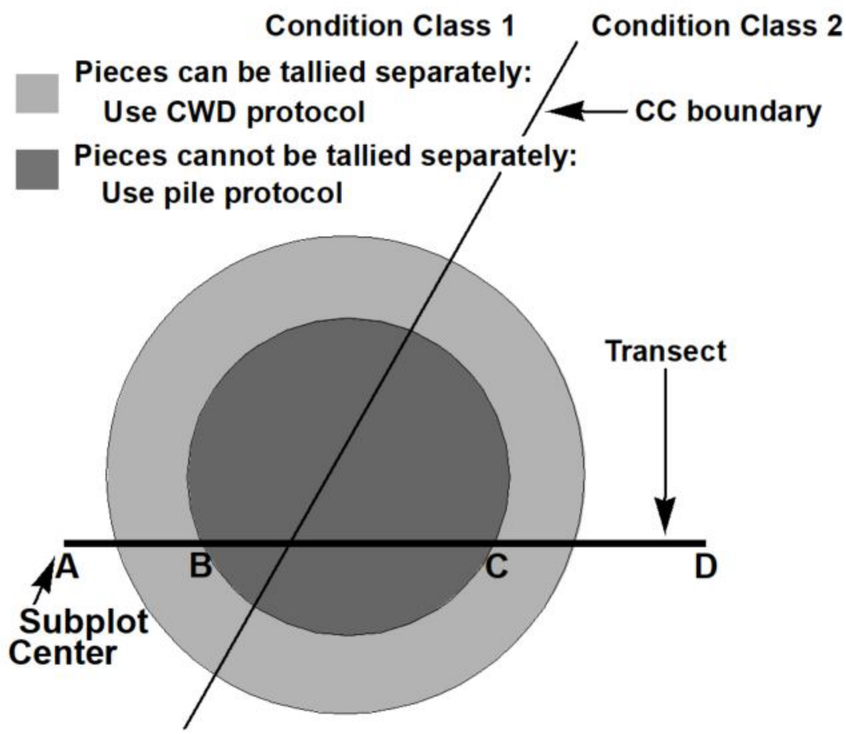


Figure 11.11: Example for measuring a pile. Pieces can be identified and tallied separately between points A-B and C-D, so the CWD protocols are used, even though part of the transect may be within the pile. Between points B and C, pieces cannot be tallied separately and the pile protocol is used. Enter the horizontal distance at B as the pile beginning distance, the horizontal distance at C as the pile ending distance, and estimate the compacted height of wood, predominant species, and predominant decay class between B and C. Assign the entire pile to condition class 1.

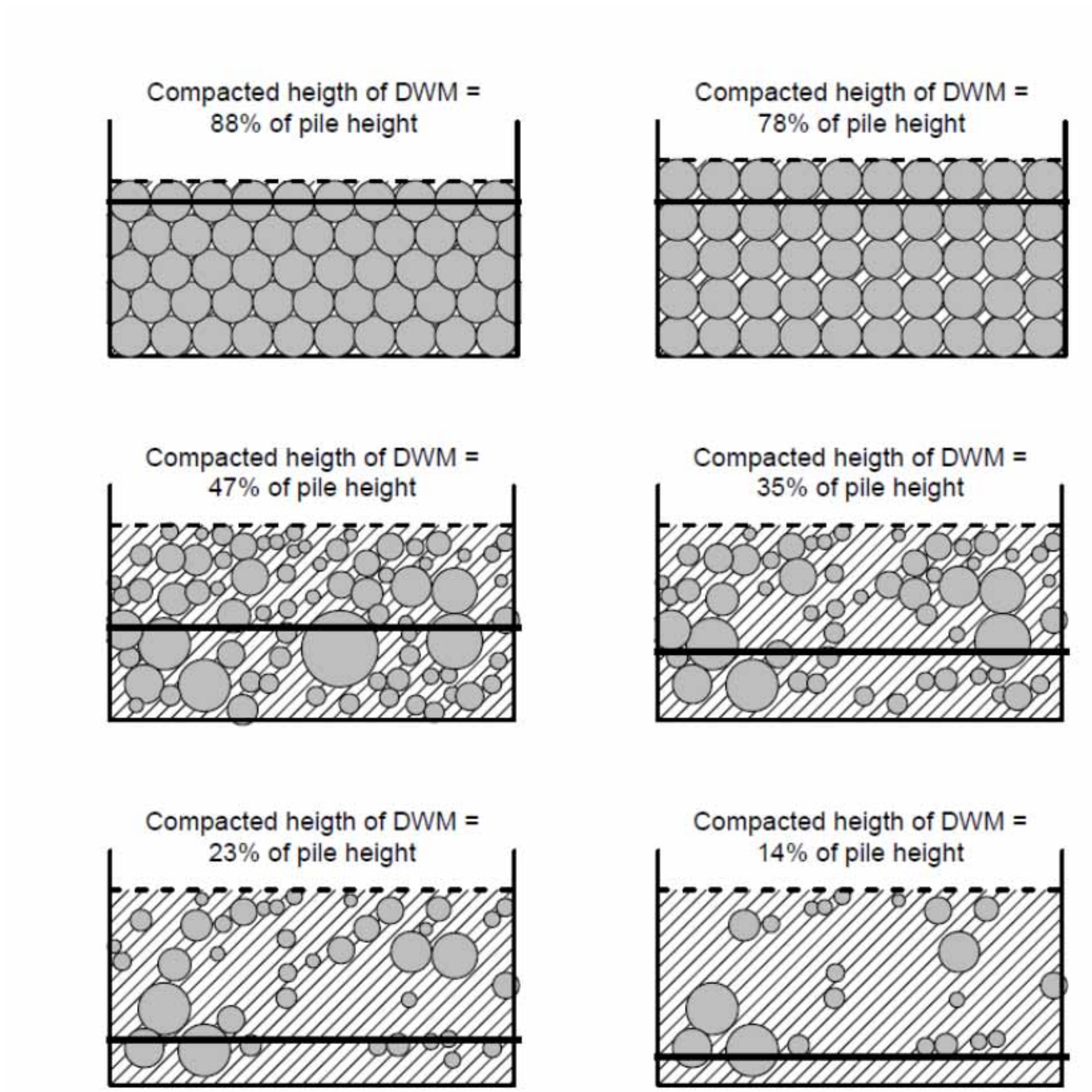


Figure 11.12: Calculating compacted height of CWD. The dashed line represents the height of the pile, the solid, thick line the compacted height of wood. Grey circles are cross sections of woody pieces greater than 3 inches of diameter and the fill represents debris, air and smaller pieces of wood.

Item 11.7.0.1 PILE SUBPLOT NUMBER (BASE 10.5.1)
[P2DWM_RESIDUE_PILEP2DWM_RESIDUE_PILE.SUBP]

Record the code indicating the number of the subplot center from which the transect originates.

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 11.7.0.2 PILE NUMBER (PNW)
[P2DWM_RESIDUE_PILE.PILEID]

Assign a unique number to identify each pile present on the subplot. PILE NUMBERs should be assigned sequentially, beginning with “1” for the first pile encountered.

When collected:	When CONDITION CLASS STATUS = 1 **or** NONFOREST CONDITION CLASS STATUS = 2
Field width:	2 digits
Tolerance:	No errors
Values:	01 to 99

Item 11.7.0.3 PILE TRANSECT (BASE 10.5.2)
[P2DWM_RESIDUE_PILE.TRANSECT]

<u>Record the azimuth of the transect on which the pile is sampled.</u>

When Collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	3 digits	
Tolerance:	No errors	
Values:	Subplot	Transect direction (degrees) from center of subplot
	1	090
		270
	2	360
		180
	3	135
		315
	4	045
		225

Item 11.7.0.4 PILE CONDITION CLASS NUMBER (BASE 10.5.3)
[P2DWM_RESIDUE_PILE.CONDID]

<u>Record the code indicating the number of the condition class. If the pile straddles two condition classes, assign it to the one closest to subplot center along the transect.</u>

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 11.7.0.5 PILE BEGINNING DISTANCE (BASE 10.5.4)
[P2DWM_RESIDUE_PILE.BEGINHORIZDIST]

<u>Record the horizontal length of the transect to the beginning of the pile (to the nearest 0.1 foot), defined as the point when pieces cannot be tallied individually. If the pile occupies subplot center, record 00.0 for the beginning distance.</u>

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	3 digits
Tolerance:	+/- 10%
Values:	00.0 to *24.0* feet

Item 11.7.0.6 PILE ENDING DISTANCE (BASE 10.5.5)
[P2DWM_RESIDUE_PILE.ENDHORIZDIST]

Record the horizontal length of the transect to the end of the pile, defined as the point when pieces can be tallied individually again. If the transect ends within the pile, record DWM TRANSECT LENGTH.

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	3 digits (xx.y)
Tolerance:	+/- 10%
Values:	00.1 to *24.0* feet

Item 11.7.0.7 COMPACTED HEIGHT OF CWD IN PILE (BASE 10.5.6)
[P2DWM_RESIDUE_PILE.COMP_HT]

Record average height of wood pieces greater than 3 inches in diameter at the intersection of the transect with the pile. Record value to the nearest foot. Visually compact the pile to estimate the height of wood, excluding air, debris and pieces of wood less than 3 inches in diameter at the point of intersection with the transect. If the transect starts or ends within a pile, only consider the portion of cross-section of the pile above the measured transect.

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	2 digits
Tolerance:	+/- 10%
Values:	1 to 99 feet

Item 11.7.0.8 PILE DECAY CLASS (BASE 10.5.7)
[P2DWM_RESIDUE_PILE.DECAYCD]

Record a 1-digit code indicating the predominant decay class in the pile. Use the guide below to determine CWD DECAY CLASS.

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1					
Field width:	1 digit					
Tolerance:	+/- 1 decay class					
Values:	Decay Class	Structural Integrity	Texture of Rotten Portions	Color of Wood	Invading Roots	Branches and Twigs
	1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
	2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
	3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish-brown or original color	Sapwood only	Branch stubs will not pull out
	4	Heartwood rotten; piece does not support its own weight, but maintains it shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Through-out	Branch stubs pull out
	5	None, piece no longer maintains its shape, it spreads out on ground	Soft; powdery when dry	Red-brown to dark brown	Through-out	Branch stubs and pitch pockets have usually rotted down

Item 11.7.0.9 PILE SPECIES (BASE 10.5.8)
[P2DWM_RESIDUE_PILE.SPCD]

Record the code indicating the predominant species in the pile.

When collected:	All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and PILE DECAY CLASS = 1 to 4
Field width:	4 digits
Tolerance:	No errors
Values:	See species codes in Appendix D

Item 11.7.0.10 RESIDUE PILE NOTES (PNW)
[P2DWM_RESIDUE_PILE.NOTES]

Record any notes needed to clarify or explain a special situation encountered with the residue pile measurements.

When collected:	All plots: as needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

SECTION 11.8 SAMPLING METHODS FOR FINE WOODY DEBRIS (FWD)

1. Fine Woody Debris (FWD) is only sampled on accessible forest land conditions (CONDITION CLASS STATUS = 1) and *accessible*, measurable nonforest conditions (NONFOREST CONDITION CLASS STATUS = 2) intersected by the transect. FWD is tallied on the outer portion of the following transects: 270° on subplot 1, 360° on subplot 2, 135° on subplot 3, and 225° on subplot 4. The length of FWD transects is measured in horizontal distance, starting at 14.0 feet and extending for 6.0 or 10.0 feet depending on FWD size class.
2. If the start of the FWD transect segment is in a measured condition (see item 1 above) but a portion of the transect segment is not visible due to the presence of snow or standing water, consider the entire transect segment not measurable. In this situation, do not sample anything on the transect segment--set FWD TRANSECT SEGMENTSAMPLE STATUS code = 0 and record the reason in FWD TRANSECT SEGMENT NONSAMPLED REASON.
3. Only sample FWD that intersects the transect in a plane from the ground to a height of 6 feet.
4. FWD is sampled in three size classes, along transect azimuths described in item 1 above (see Section 11.5 for details on transects). Pieces in two FWD size classes (0.01 to 0.24 inches and 0.25 to 0.9 inches) are counted on a 6-foot transect, from 14 to 20 feet horizontal distance. Pieces in the largest size class (1.0 to 2.9 inches) are counted on a 10-foot transect, from 14 to 24 feet. These transects overlap. Note: individual diameters are not recorded for FWD.
5. Count a piece of FWD if it intersects the transect. Be sure to count only woody material such as a twig, branch, wood fragment, or small shrub or tree bole Do not count material that is actually litter, such as pine or fir needles, non-woody parts (e.g., petiole and rachis) of a shrub or tree, etc. Do not count roots or main bole below the root collar.
6. Accumulate the number of pieces counted within each size class and enter the total count on one record for the subplot. If there is no tally on a transect, enter zeros for the count. If the transect is not measured (FWD TRANSECT SAMPLE STATUS = 0) the count is null.
7. Accurate counts of FWD can be conducted efficiently up to about 50 pieces for small and medium size classes, and up to 20 pieces for the large size class. After that, crews can begin estimating counts in a systematic fashion. Transects that fall on very dense FWD where counting is nearly impossible, can be sub-sampled and calculated. For example, an accurate count can be conducted on a 2.0-foot section of the transect and then multiplied by 3 to provide an estimate for the 6 foot transect, as long as the crew feels that the remaining transect has a similar density of FWD pieces.
8. If a transect intersects a large pile of material such as a wood rat's nest, recently fallen tree (with many attached fine branches), or a residue pile, crews should estimate a count based on # 7 above, but also enter a code indicating that this is an unusual situation (see Item 11.8.0.9). In the case of a residue pile on the transect, estimate a count by looking at the transect just before and after the pile along with assessing what's inside the pile, and enter a count for the whole transect.

9. If rocks or logs are present along the transect (14- to 24-foot section) include any FWD that is present on top of these things in the respective FWD counts. If the obstructions are so large (huge boulder) that the top surface cannot be seen, assume the count is zero in this area, and continue counting if there is transect line beyond the boulder.
10. If a transect crosses a condition class boundary, record the condition class number and enter a count for each condition on separate records. Transect lengths within each condition class will be obtained from the transect segmenting data entered for the plot.

Item 11.8.0.1 FWD SUBPLOT NUMBER (BASE 10.6.1)
[P2DWM_FWD.SUBP]

Record the code indicating the subplot center from which the transect originates.

When collected:	All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 11.8.0.2 FWD TRANSECT (BASE 10.6.2)
[P2DWM_FWD.TRANSECT]

Record the azimuth (degrees) of the transect on which FWD is sampled.

When collected:	All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	3 digits	
Tolerance:	No errors	
Values:	degrees	
	Subplot	Transect direction (degrees) from center of subplot
	1	270
	2	360
	3	135
	4	225

Item 11.8.0.3 FWD CONDITION CLASS NUMBER (BASE 10.6.3)
[P2DWM_FWD.CONDID]

Record the code indicating the number of the condition class at the start of the transect (14.0 feet horizontal distance from subplot center).

When collected:	All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 11.8.0.4 FWD TRANSECT SEGMENT SAMPLE STATUS (BASE 10.6.4)
[P2DWM_FWD.FWD_STATUS_CD]

Record the sample status for FWD on the transect. There may be situations where the CWD is measurable, but the FWD is hidden from view by snow or water and not measurable. If any part of the FWD transect segment is on a measured condition but the FWD is not measurable, do not count any FWD and set the STATUS code to 0 and the FWD TRANSECT NONSAMPLED REASON code to 10.

In all other situations, set the code to 1. Conditions on which FWD would not be measured regardless (CONDITION CLASS STATUS = 3 or CONDITION CLASS STATUS = 2 AND NONFOREST CONDITION CLASS STATUS = 5) should always be coded 1.

When collected:	All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	FWD transect segment not sampled
	1	FWD transect segment sampled

Item 11.8.0.5 FWD TRANSECT SEGMENT NONSAMPLED REASON (BASE 10.6.5)
[P2DWM_FWD.FWD_NONSAMPLE_REASN_CD]

Record the reason that FWD cannot be measured on the transect.

When Collected:	All FWD transect segments where FWD TRANSECT SEGMENT SAMPLE STATUS = 0	
Field width:	2 digits	
Tolerance:	No errors	
Values:	05	Lost data (office use only)
	10	Other (for example, snow or water covering *FWD* that is supposed to be sampled). *FINE WOODY DEBRIS NOTES required* when using this code.

Item 11.8.0.6 SMALL FWD COUNT (BASE 10.6.6)
[P2DWM_FWD.SMALLCT]

Record the number of pieces counted in this size class (0.01 to 0.24-inch diameter) along the transect segment. An accurate count should be conducted up to 50 pieces. If the count exceeds 50, the transect can be sub-sampled to estimate a total count for the transect length (see Section 11.8, #8).

When collected:	All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	3 digits
Tolerance:	0 to 50 = +/- 20% of the total count for the transect 51 to 100 = +/- 25% of the total count for the transect 100 + = +/- 50% of the total count for the transect
Values:	000 to 999 pieces

Item 11.8.0.7 MEDIUM FWD COUNT (BASE 10.6.7)
[P2DWM_FWD.MEDIUMCT]

Record the number of pieces counted in this size class (0.25 to 0.99-inch diameter) along the transect segment. An accurate count should be conducted up to 50 pieces. If the count exceeds 50, the transect can be sub-sampled to estimate a total count for the transect segment (see Section 11.8, # 8).

When collected:	All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	3 digits
Tolerance:	+/- 20% of the total count for the transect
Values:	000 to 999 pieces

Item 11.8.0.8 LARGE FWD COUNT (BASE 10.6.8)
[P2DWM_FWD.LARGECT]

Record the number of pieces counted in this size class (1.0 to 2.9 inch diameter) along the transect segment. An accurate count should be conducted up to 20 pieces. If the count exceeds 20, the transect can be sub-sampled to estimate a total count for the transect segment (see Section 11.8, # 8).

When collected:	All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	3 digits
Tolerance:	+/- 20% of the total count for the transect
Values:	000 to 500 pieces

Item 11.8.0.9 HIGH COUNT REASON (BASE 10.6.9)
[P2DWM_FWD.REASNCTCD]

Enter a code that applies to the situation encountered on the transect. Enter a code if any of the counts on the transect are greater than 100 pieces.

When collected:	All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1 and (SMALL FWD COUNT ≥ 100 or MEDIUM FWD COUNT ≥100 or LARGE FWD COUNT ≥100	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	High count is due to an overall high density of FWD across the transect
	2	Wood Rat's nest located on transect
	3	Tree or shrub laying across transect
	4	Other reason
	5	Residue pile

Item 11.8.0.10 FINE WOODY DEBRIS NOTES (PNW)
[P2DWM_FWD.NOTES]

Record any notes needed to clarify or explain a special situation encountered with a piece of FWD.

When collected:	All plots: as needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

SECTION 11.9 DUFF AND LITTER DEPTH MEASUREMENTS

Depth measurements are sampled in accessible forest land conditions (and accessible nonforest conditions, where nonforest conditions are measured). The depth of the duff layer and litter layer are important components of carbon tracking and fire models that estimate fire behavior, fire spread, fire effects, and smoke production. These measurements are taken at the 24-foot location on each transect. If an object such as a rock, log, or residue pile is present at the sample point, depths will be estimated by examining the surface of the object or the area surrounding the object. In the office, an average depth will be calculated and stored with other information about the condition class on the plot.

SUBSECTION 11.9.1 DEFINITIONS

1. Litter is the layer of freshly fallen leaves, needles, twigs (<0.25 inch in diameter), cones, detached bark chunks, dead moss, dead lichens, detached small chunks of rotted wood, dead herbaceous stems, and flower parts (detached and not upright). Litter is the loose plant material found on the top surface of the forest floor which is undecomposed or only partially decomposed organic material. The components of the litter layer can still be readily identified (e.g., plant leaves, twigs, and peat, etc.).

   Litter is flash fuel – so think about it as the loose material that is exposed to the air, capable of igniting quickly and carrying a fire across the surface of the forest floor.

   Litter does not include bark that is still attached to a down log, or rotten chunks of wood that are still inside a decaying log or log end (i.e., if a decayed log end has a lot of rotten cubes or pieces laying on a log surface and exposed to air, they are considered part of the log and not litter – fire would burn differently if it hit a pile of rotten punky wood chips cradled by the unrotted sapwood shell). If these rotten chunks have spilled out to the ground and are actually on the ground surface, then they would be included in the litter layer.

Litter does not include animal manure.

2. Duff is the layer just below litter located just above the A-horizon (or uppermost soil mineral horizon). Duff is a dark soil layer dominated by organic material derived from the decomposition of plant and animal litter (pine straw, leaves, twigs, etc) and deposited on top of an organic or mineral surface. This layer is distinguished from the litter layer in that the original organic material has undergone sufficient decomposition that the source of this material (e.g., individual plant parts) can no longer be identified. You should see no recognizable plant parts. When moss is present, the top of the duff layer is just below the green portion of the moss.

   If peat is present in your part of the country, record it with the duff layer. Peat is an accumulation of partially decayed vegetation matter that forms under conditions of poor drainage such as those found in wetlands or bogs. A layer of peat develops when dead plant material is inhibited from decaying fully because of acidic or anaerobic conditions. In some areas of the U.S. the depth of this layer can be extensive.

SUBSECTION 11.9.2 OVERVIEW OF MEASUREMENTS

Depth measurements will be taken at the 24-foot (horizontal distance) location on each transect. If a log, rock, or residue pile occurs at the sample location, record the depth of the litter on top and below these objects and estimate the duff depth as close to the object as possible. Examine the area around the object to develop an average depth for these layers.

DUFF/LITTER SAMPLE STATUS identifies whether or not the duff and litter depth could be measured or reasonably estimated. Examples of situations where measurement is not possible include the presence of snow or standing water at the sample location. In this case, the STATUS code is set to *0* with the DUFF/LITTER NONSAMPLED REASON code set to 10.

The DUFF AND LITTER METHOD variable has three options for indicating if duff and litter were measured or estimated at each sample location. The default value for this variable is 1, indicating that both depths were measured and recorded. A code of 2 means that litter depth was measured, but duff depth was estimated and a code of 3 indicates that both duff and litter depths were estimated.

Carefully expose a shallow profile of the forest floor by digging out an area at the sample point using a knife, hatchet, or other tool. Estimate the depth of each layer with a ruler to the nearest 0.1 inch. As you dig the hole for this measurement, if you encounter a subsurface rock, root, or buried log – stop the depth measurement at this point. If there is a log, rock, or residue pile on the surface at the sample point, and there appears to be duff and litter under it (or litter on top of it), record a reasonable estimate for each depth. Most likely, the area immediately adjacent to the obstruction will have to be examined to determine an average depth. Depths of zero are perfectly valid: for example if the point falls on bedrock or on top of a log that is resting on mineral soil.

As a general rule, duff depth should rarely exceed a few inches (except when a peat layer is present). Crews should be absolutely sure they are measuring deep duff depths, instead of mineral soil layers or parts of the litter layer. Duff can easily weigh more than 6 times that of litter. If unsure of the bottom of the duff layer, crews should feel the texture of the suspect material in their hand. Rub the soil between your fingers. Does it crumble (duff) or feel more like modeling clay (mineral). If the layer includes a substantial amount of peat, stop the measurement at 2 feet.

The height of the litter should be measured at the top of the loose material located at the sample point on the transect (or nearby if an obstruction exists). Try to preserve the conditions of this location by walking around this point, so the QA staff will measure the same height as the original crew.

Item 11.9.2.1 DUFF/LITTER SUBPLOT NUMBER (BASE 10.7.3)
[P2DWM_DUFF_LITTER.SUBP]

Record the code indicating the number of the subplot center from which the transect originates.

When collected:	All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 11.9.2.2 DUFF/LITTER TRANSECT (BASE 10.7.4)
[P2DWM_DUFF_LITTER.TRANSECT]

Record the azimuth (degrees) of the transect on which duff/litter is sampled.

When collected:	All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	3 digits	
Tolerance:	No errors	
Values:	Subplot	Transect direction (degrees) from center of subplot
	1	090
		270
	2	360
		180
	3	135
		315
	4	045
		225

Item 11.9.2.3 DUFF/LITTER CONDITION CLASS NUMBER (BASE 10.7.5)
[P2DWM_DUFF_LITTER.CONDID]

Record the code indicating the number of the condition class at the sample point (24.0 feet horizontal distance from subplot center).

When collected:	All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 11.9.2.4 DUFF/LITTER SAMPLE STATUS (BASE 10.7.6)
[P2DWM_DUFF_LITTER.DL_STATUS_CD]

Record the sample status for duff and litter depth on the transect. There may be situations where the CWD is measurable (e.g., shallow depth of snow or water), but the duff and litter are not measurable. If the measurement point is on a measured condition but the duff/litter is not measurable, do not measure duff/litter and set code to 0 with the DUFF/LITTER NONSAMPLED REASON code set to 10.

In all other situations (including where duff and litter depth = 0), set the code to 1. For example, conditions on which duff/litter would not be measured regardless (CONDITION CLASS STATUS = 3 or NONFOREST CONDITION CLASS STATUS = 5) should always be coded 1.

When collected:	All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1	
Field width:	1 digit	
Tolerance:	No errors	
Values:	0	Duff and litter point not sampled
	1	Duff and litter point sampled

Item 11.9.2.5 DUFF/LITTER NONSAMPLED REASON (BASE 10.7.7)
[P2DWM_DUFF_LITTER.DL_NONSAMPLE_REASN_CD]

Record the reason that duff/litter cannot be measured on the transect.

When Collected:	All duff/litter transects where DUFF/LITTER SAMPLE STATUS = 0	
Field width:	2 digits	
Tolerance:	No errors	
Values:	05	Lost data (office use only)
	10	Other (for example, snow or water covering measurement point that is supposed to be sampled). *DUFF, LITTER, FUELBED NOTES required* when using this code

Item 11.9.2.6 DUFF DEPTH (BASE 10.7.8)
[P2DWM_DUFF_LITTER.DUFFDEP]

Record the code indicating the depth of the duff layer to the nearest w0.1 inch. If the depth exceeds 5.0 inches, record an estimated depth to the nearest 0.1 inch using a probe or plot pin and enter Code #2 (Litter depth was measured, duff depth (≤24.0 inches) was estimated) for 10.9.8 DUFF AND LITTER METHOD. Record 24.0 inches when DUFF DEPTH is >24.0 inches and enter Code #4 (Litter depth was measured, duff (peat) depth exceeds 24.0 inches) for 10.9.8 DUFF AND LITTER METHOD.

When collected:	All duff/litter transects in measurable conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) where DUFF/LITTER SAMPLE STATUS = 1
Field width:	3 digits (xx.y)w41
Tolerance:	+/- 0.5 inch
Values:	00.0 to 24.0 inches

Item 11.9.2.7 LITTER DEPTH (BASE 10.7.9)
[P2DWM_DUFF_LITTER.LITTDEP]

Record the code indicating the depth of the litter layer to the nearest 0.1 inch.

When collected:	All duff/litter transects in measurable conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) where DUFF/LITTER SAMPLE STATUS = 1
Field width:	3 digits (xx.y)
Tolerance:	+/- 0.5 inch
Values:	00.0 to 99.9 inches

Item 11.9.2.8 DUFF AND LITTER METHOD (BASE 10.7.10)
[P2DWM_DUFF_LITTER.DL_METHODCD]

Record the code indicating whether duff and litter depths were measured or estimated.

When Collected:	All duff/litter transects where DUFF/LITTER SAMPLE STATUS = 1 and duff/litter transect is in a measurable condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2)	
Field width:	1 digit	
Tolerance:	No errors	
Values:	1	Both duff and litter depth were measured
	2	Litter depth was measured, duff depth (≤ 24.0 inches) was estimated
	3	Both duff and litter depth were estimated
	4	Litter depth was measured, duff (peat) depth exceeds 24.0 inches (*DUFF AND LITTER NOTES* required)

Item 11.9.2.9 DUFF AND LITTER NOTES (PNW)
[P2DWM_DUFF_LITTER.NOTES]

Record any notes needed to clarify or explain a special situation encountered with the DUFF or LITTER measurements.

When collected:	All plots: as needed
Field width:	2000 characters
Tolerance:	N/A
Values:	Single words and abbreviated sentences

CHAPTER 12 VEGETATION PROFILE

The Phase 2 (P2) Vegetation data are collected to describe vegetation structure and dominant species composition for vascular plants. The data collected provide a horizontal and vertical estimation of vegetation located within the sample area and provide information about the most abundant species found on the subplot. Information on the abundance, structure, and species composition of understory plant communities has many uses. It can be used to assess wildlife habitat, biomass, forage availability, grazing potential, vegetation competition with tree growth, fuel loadings from understory vegetation, and potential site productivity. The most abundant species provide information to describe plant communities and to predict associated forest stand characteristics. Accurately representing the species present on a site and monitoring their change in abundance in response to forest development, disturbance, or management is therefore important to a wide variety of users. This information is also used to augment forest ecosystem health assessments from Phase 3 (P3) plots, in terms of vegetation structure and rates of change of community vascular plant composition.

SECTION 12.1 VEGETATION SAMPLING DESIGN

The P2 Vegetation Profile includes measurements of Vegetation Structure - canopy cover by layer and total aerial canopy cover of each growth habit - with additional *data* collected on the most abundant species.

P2 Vegetation is sampled within the 24.0-foot radius subplot. Vegetation data is collected on all accessible forest land and accessible, measurable nonforest conditions in California, Oregon, and Washington. If the area of an accessible condition class is less than 100 percent on a subplot, P2 Vegetation measurements are recorded only on the portion that is in the accessible condition class(es). If multiple accessible condition classes are present on the subplot, separate estimates are made for each accessible condition class on the subplot. The P2 Vegetation Profile is best recorded when all plant species are fully leafed out. However, crews may end up visiting plots early in the season before leaves are fully expanded or late in the season when plants are beginning to senesce. Notes can be added to *Item 12.3.1.2, VEGETATION SUBPLOT NOTES (CORE OPTIONAL 3.14)* indicating unusual phenological conditions *(e.g., after leaf fall)*. Crews should *avoid* collect*ing* P2 Vegetation data when snow covers the subplot, Item 6.1.1.12, P2 VEG SUBPLOT SAMPLE STATUS (CORE OPTIONAL 3.14).

SECTION 12.2 GENERAL DEFINITIONS

Canopy Cover – Canopy cover is defined as the area of ground surface covered by a vertical projection of the canopy of a vascular plant. The canopy is described by a polygon surrounding the outer edges of the foliage (Figure 12.1), without subtracting any normal spaces occurring between the leaves of plants (Daubenmire 1959[1]). Overlapping crowns are not double-counted (visualize the canopy cover collapsed into a 2-dimensional space); the maximum possible canopy cover is the percentage of the subplot area within the accessible condition.

All canopy cover estimates are focused on foliage within the sampled accessible condition class(es) within the subplot perimeter (24.0-foot radius, horizontal distance). Canopy cover is estimated for each sampled accessible condition of the subplot. If multiple sampled accessible conditions occur on a subplot, treat the condition boundary as a vertical wall on the plot: plant foliage is included in the condition it is hanging over, even if the plant is rooted in a different condition. However, the canopy cover value is always estimated as a percentage of an entire subplot. That is, if the canopy cover within the accessible condition is about equal to a circle with a radius of 5.3 feet, the canopy cover estimate will always be 5 percent, even if only 30 percent of the subplot is in the accessible condition on which the canopy cover is being measured.

Canopy cover is collected by height layer and as a total (aerial view) across all layers for each growth habit in Section 12.5 Vegetation Structure. For each layer, examine the canopy cover of each Structure Growth Habit as if the other growth habits and other layers do not exist. If a Structure Growth Habit does not have foliage in a layer, enter 0 (do not count tree boles as cover). For total aerial canopy cover by Structure Growth Habit, examine each growth habit individually as if the other growth habits do not exist. Total aerial canopy cover is collected for each most abundant species in Section 12.4 Species Composition; examine each species individually, as if the other species do not exist.

1. Daubenmire. R. 1959. A canopy-coverage method of vegetational analysis. Northwest Science 33(1): 43-64.

Canopy cover is estimated to the nearest 1 percent. For Vegetation Structure assessments, canopy cover >0 and ≤1 percent is coded as 1 percent (i.e. trace amounts are coded as 1%). For Species Composition assessments, a species must have at least 3 percent total aerial canopy cover (i.e. do not round total aerial canopy cover <3% up to 3%).

Canopy cover is vertically projected from the outline of the foliage *(or outline of the live buds, twigs and stems, and partially leafed out foliage if early in the season)* at the time of plot visit. All foliage that is or was alive during the current growing season is included in the cover estimates. Canopy cover from broken tops and stems is included, unless completely detached. Do not ocularly upright leaning trees.

See tabulation below for canopy cover to area relationships for a 1/24 acre subplot and Figure 12.3: Example of growth habit by layer and species and Figure 12.4 for additional visual calibrations.

Cover	Area (ft^2)	Square length on side (ft)	Circle radius (ft)
1%	18	4.3	2.4
3%	54	7.4	4.2
5%	90	9.5	5.4
10%	181	13.4	7.6
15%	271	16.5	9.3
20%	362	19.0	10.7
25%	452	21.3	12.0
50%	905	30.1	17.0

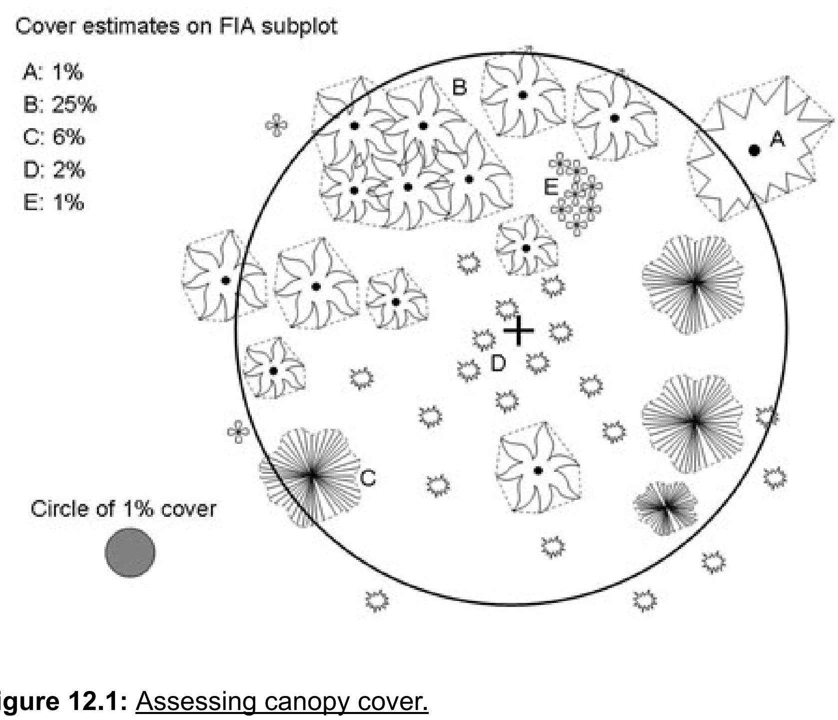


Figure 12.1: Assessing canopy cover.

Growth Habits – P2 Vegetation data are collected by growth habits at each level of detail. In general, growth habits for vascular plants include trees, shrubs/subshrubswoody vines, forbs, and graminoids.

Layer Codes – Structure Growth Habits are assessed by layers in Section 12.5 Vegetation Structure, and one of the following layer codes, see Item 12.4.0.9, SPECIES VEGETATION LAYER (CORE OPTIONAL 8.5.5), will be assigned to individual plant species' SPECIES GROWTH HABITs in Section 12.4 Species Composition. Measure the layer height from ground level; see Figure 12.2 for examples of measuring layer heights on sloping and uneven ground.

Layer 1	0 to 2.0 feet
Layer 2	2.1 to 6.0 feet
Layer 3	6.1 to 16.0 feet
Layer 4	Greater than 16 feet

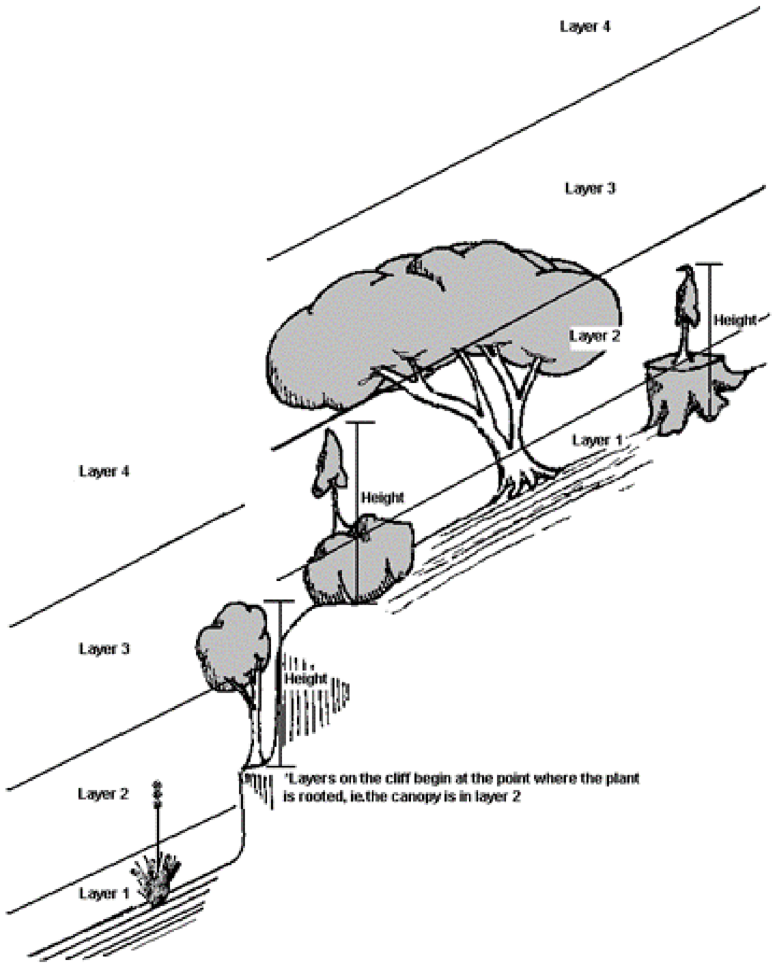


Figure 12.2: To determine the layer of a plant, measure the height of the layer from the ground.

NRCS PLANTS database – The Natural Resource Conservation Service (NRCS) PLANTS Database provides standardized information about the vascular plants, mosses, liverworts, hornworts, and lichens of the U.S. and its territories. It includes names, plant symbols, checklists, distributional data, species abstracts, characteristics (including growth habits), images, crop information, automated tools, onward Web links, and references:

USDA, NRCS. 2017. The PLANTS Database (http://plants.usda.gov, 1 September 15, 2017). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

FIA currently uses a stable code set downloaded September 15, 2017.

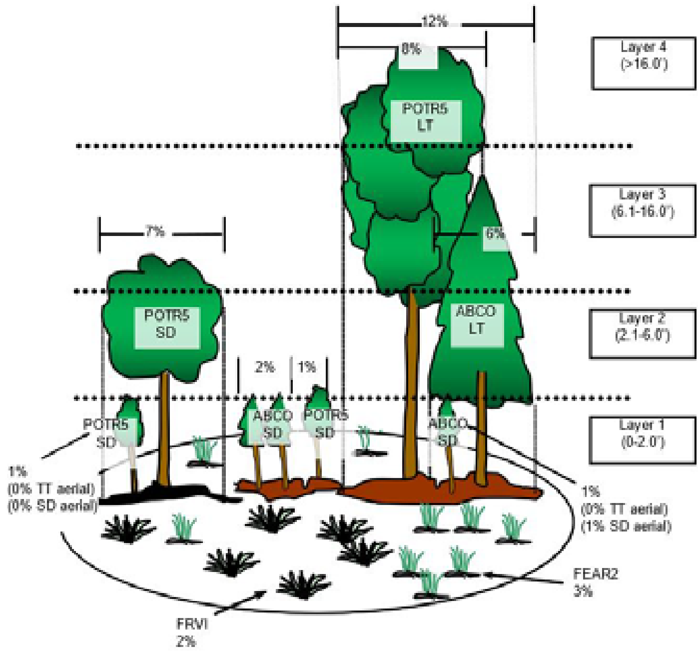


Figure 12.3: Example of growth habit by layer and species

Table 12.1:Estimation of canopy cover by layer and aerial view of each Structure Growth Habit in Figure 12.3

Vegetation Structure Growth Habit	Layer 1 (0-2.0 ft)	Layer 2 (2.1- 6.0 ft)	Layer 3 (6.1-16.0 ft)	Layer 4 (>16.1 ft)	Aerial
	Percent canopy cover				
Tally tree sp (TT)	005	013	019	008	022
Non-tally tree sp (NT)	000	000	000	000	000
Shrub/Subshrub/Woody Vine (SH)	000	000	000	000	000
Forb (FB)	002	000	000	000	002
Graminoid (GR)	003	000	000	000	003

Table 12.2:Estimation of total aerial canopy cover by species in Figure 12.3

Level of Detail	Species Growth Habit	Species Code	Cover	Layer
2	GR	FEAR2	003	1
2	SD	ABCO	003	1
2	SD	POTR5	008	3
3	LT	POTR5	008	4
3	LT	ABCO	006	3

Note: FRVI, estimated at 2 percent, was not recorded, and ABCO and POTR5 are present as two different SPECIES GROWTH HABITs (seedling/sapling and large tree) with at least 3 percent total aerial cover within the SPECIES GROWTH HABIT on the subplot.

SECTION 12.3 VEGETATION DATA COLLECTION LOCATION

SUBSECTION 12.3.1 SUBPLOT - LEVEL DATA ITEMS

Item 12.3.1.1 SUBPLOT NUMBER (CORE OPTIONAL 8.3.1)
[SUBPLOT.SUBP]

Record the code corresponding to the number of the subplot.

When collected:	On all subplots where P2 vegetation is being sampled (P2 VEGETATION SAMPLING STATUS = 1 or 2)	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Definition
	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 12.3.1.2 VEGETATION SUBPLOT NOTES (CORE OPTIONAL 3.14)
[P2VEG_SUBP_STRUCTURE.NOTES]

Use this field to record notes pertaining to the subplot, and any unusual conditions encountered.

When plant specimens are collected, use this field to record a community type description for each subplot sampled for P2 Vegetation. The community description is intended to fully automate the specimen collection process by providing a description of the community in which this plant was found. Some examples of community descriptions are as follows:

- 25 year aspen boundary of mature trees. very little slope. a lot of light entry
- *Acer saccharum* floodplain forest. hummock-hollow microtopography.
- mature mesic hemlock-hardwood forest adjacent to pond

The community type description field is a note that is accessible via Ctrl+E from the P2 Subplot screen for P2VEG.

When collected:	VEGETATION NONSAMPLED REASON = 10 or as needed
Field width:	2000 alphanumeric characters
Tolerance:	N/A
Values:	English language words, phrases, and numbers

SECTION 12.4 SPECIES COMPOSITION

Identify the (up to) four most abundant species within each SPECIES GROWTH HABIT (tree seedlings and saplings, shrubs/subshrubs/woody vines, forbs, graminoids, and arge trees) that occupy 3 percent or greater total aerial canopy cover on the subplot and within the SPECIES GROWTH HABIT (do not round total aerial canopy cover <3% up to 3%.). Although up to four species per SPECIES GROWTH HABIT can be recorded, crews should not spend more than 5 minutes searching for additional species when less than four species are not readily observable. The methods described assume that only one field crew member per plot is entering P2 Vegetation Profile data.

When there are multiple accessible conditions within a subplot, the species must be present at 3 percent or more total aerial canopy cover on the full 24-foot radius subplot and within the SPECIES GROWTH HABIT in order to be recorded. If part of the subplot is a non-sampled condition (e.g., nonforest condition, not sampled for P2 Vegetation because 4.2.1.15 P2 VEGETATION SAMPLING STATUS = 1; or inaccessible condition, not sampled because 5.7.0.4 CONDITION CLASS STATUS = 5), estimate total aerial canopy cover for the full subplot if possible; otherwise assume the species canopy cover is the same on the non-sampled portion. If a species is present at 3 percent total aerial canopy cover or more on the full subplot and within the SPECIES GROWTH HABIT, record SPECIES GROWTH HABIT, SPECIES CANOPY COVER, and SPECIES VEGETATION LAYER separately for each accessible condition. SPECIES

CANOPY COVER values less than 3 percent for a condition are valid as long as the total aerial canopy cover of the species on the full subplot and within the SPECIES GROWTH HABIT is at least 3 percent. See Figure 12.4 for an example of species total aerial canopy cover estimation. See Figure 12.5 for a Species Composition subplot flow.

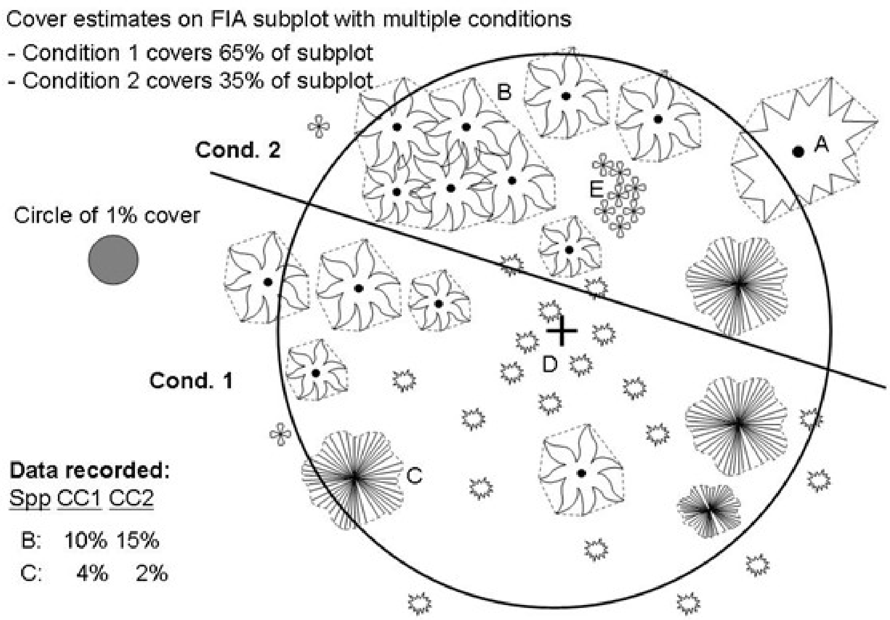


Figure 12.4: Example of species total aerial canopy cover estimation on a subplot with 2 accessible conditions. See Figure 12.1 for total aerial canopy cover across the subplot. In Figure 12.1, species A, D, and E would be included in estimates of Vegetation Structure by Structure Growth Habit, but not recorded for Species Composition. Note that species with subplot total aerial canopy cover <3% are not recorded, but that SPECIES CANOPY COVER recorded on an accessible condition can be less than 3%.

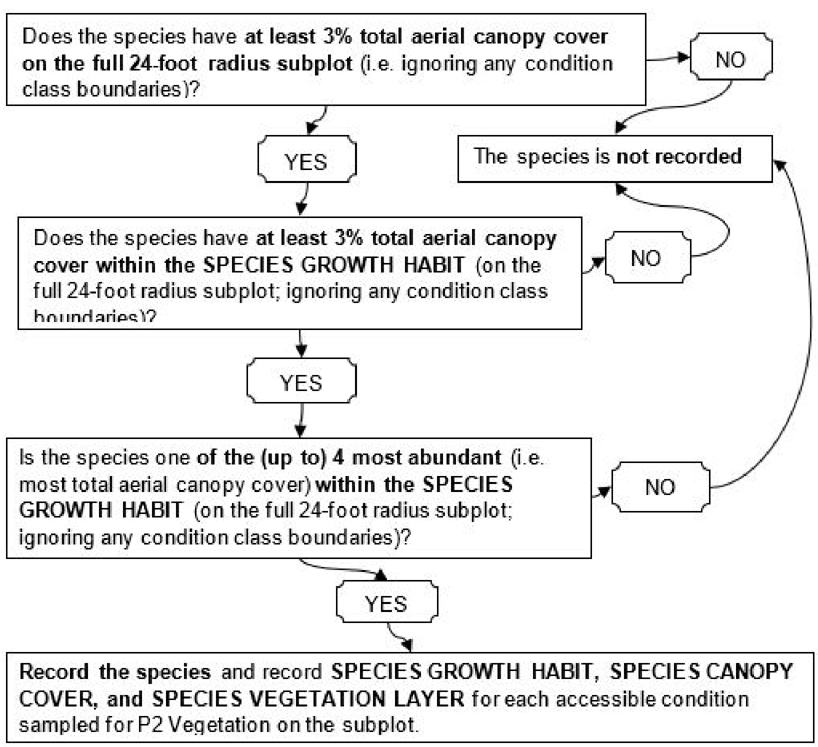


Figure 12.5: Species Composition subplot flow chart.

Item 12.4.0.1 SPECIES CODE (CORE OPTIONAL 8.5.2)
[P2VEG_PLOT_SPECIES.VEG_FLDSPCD]

Record a code for each most abundant (see Section 12.4, Species Composition) vascular plant species *(i.e. one of the four most abundant species within each growth habit group (tree seedlings and saplings, shrubs/woody vines, forbs, graminoids, and overstory trees) that occupy 3 percent or greater canopy cover on the subplot)*. Species codes must be the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database (currently September 15, 2017 version). Identification to species only is expected. However, if subspecies information is known, enter the appropriate NRCS code. For graminoids, genus and unknown codes are acceptable, but do not lump species of the same genera or unknown code. For example, if several unknown CAREX species are present, only record the individual most abundant species.

If a plant cannot be identified quickly and confidently, assign a NRCS PLANTS genus or unknown code *(listed below)* appropriate to the species. Collect a specimen away from the subplot unless the species is locally sparse or another SPECIMEN NOT COLLECTED REASON CODE (12.4.0.6) applies. A species is "locally sparse" if 5 or fewer plants are present in the entire plot (4 subplots) and immediate surrounding area. A species may be sparse and still meet the criteria for inclusion in species composition, but this will be rare.

Acceptable unknown codes

Code	Common Name
2FERN	Fern or Fern Ally
2FORB	Forb (herbaceous, not grass nor grasslike)
2FD	Forb, dicot
2FM	Forb, monocot
2GRAM	Graminoid (grass or grasslike)
2GA	Grass, annual
2GP	Grass, perennial
2GL	Grass-like, (sedges and rushes)
2PLANT	Plant
2SHRUB	Shrub (>0.5m)
2SUBS	Subshrub (<0.5m)
2TREE	Tree
2VH	Vine, herbaceous
2VW	Vine, woody

When collected:	Species total aerial canopy cover on the full subplot and within a SPECIES GROWTH HABIT is 3 percent or greater
Field width:	8 alpha-numeric characters
Tolerance:	No errors
Values:	Accepted NRCS species code when the species is known, or an accepted NRCS genus or unknown code when the species is not known

Item 12.4.0.2 UNIQUE SPECIES NUMBER (CORE OPTIONAL 8.5.3)
[P2VEG_PLOT_SPECIES.UNIQUE_SP_NBR]

When any *SPECIES CODE* is entered for the first time on a plot, it is assigned UNIQUE SPECIES NUMBER = 1. If more than one unidentified species is discovered that is described by the same genus or *acceptable* unknown code *(see SPECIES CODE above)*, the next sequential number is assigned. If a recorded unidentified species is encountered again elsewhere on the plot, the field crew records the species with the same genus or unknown code with the same unique species number.

When collected:	All species recorded
Field width:	2 digits
Tolerance:	No errors
Values:	1-99, assigned in sequential numbers

Item 12.4.0.3 SPECIES CODE TYPE (PNW)
[P2VEG_PLOT_SPECIES.SPCD_TYPE]

When any SPECIES CODE is entered, it is automatically assigned a SPECIES CODE TYPE determined by its classification into one of the three SPECIES CODE TYPEs; G = Genus, S= Species, U = Unknown. A VEGETATION SPECIES NOTE is required when codes G or U are used.

When collected:	All SPECIES CODEs	
Field width:	1 alpha character	
Tolerance:	N/A	
Values:	Code	Definition
	G	Genus
	S	Species
	U	Unknown

Item 12.4.0.4 SPECIES CODE STATUS (PNW)
[P2VEG_PLOT_SPECIES.SPCD_STATUS]

When any SPECIES CODE is entered which is not expected in the applicable state, SPECIES CODE STATUS is automatically assigned; SPECIES CODE STATUS = #.

When collected:	All SPECIES CODEs not expected in the applicable state
Field width:	1 alpha character
Tolerance:	N/A
Values:	#

Item 12.4.0.5 SPECIMEN OFFICIALLY COLLECTED (CORE OPTIONAL 8.5.6)
[P2VEG_PLOT_SPECIES.SPECIMEN_COLLECTED]

Record a code to indicate whether or not a specimen was collected or not for each species, genus or unknown code entered as a new unique species. Crews in California, Oregon, and Washington are not required to collect official specimens to be sent to herbaria, but are encouraged to collect samples of common species they can't identify and informally seek assistance from other crew members, agency personnel, or local botanists if possible.

When collected:	All species recorded	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Description
	0	No, a specimen was not collected
	1	Yes, a specimen was collected

Item 12.4.0.6 P2 SPECIMEN NOT COLLECTED REASON CODE (CORE OPTIONAL 8.5.8)
[P2VEG_PLOT_SPECIES.SPECIMEN_NOT_COLLECTED_REASON]

Record the code that describes why a specimen has not been collected.

When collected:	An unknown code or genus code is entered and SPECIMEN OFFICIALLY COLLECTED = 0	
Field width:	2 digits	
Tolerance:	No errors	
Values:	Code	Description
	01	Species is locally sparse (fewer than 5 individual plants in area of the plot)
	02	Species has no mature foliage or reproductive parts present, so is unlikely to be identifiable if collected.
	03	Hazardous situation
	04	Time limitation
	05	Wilderness or reserved land where plant collections are not allowed
	06	Specimen collected for immediate/local identification
	07	Not required by inventory unit
	10	Other (explain in notes)

Item 12.4.0.7 SPECIMEN LABEL NUMBER (CORE OPTIONAL 8.5.7)
[P2VEG_PLOT_SPECIES.SPECIMEN_LABEL_NBR]

Record the label number for the collected specimen. Pre-numbered labels are provided to each crew by the regional coordinator or auto-generated with the data collection software.

When collected:	SPECIMEN OFFICIALLY COLLECTED = 1
Field width:	5 digits
Tolerance:	No errors
Values:	1 to 99999, as pre-printed and assigned by region or auto-generated in the PDR

Item 12.4.0.8 SPECIES GROWTH HABIT (CORE OPTIONAL 8.5.1)
[P2VEG_SUBPLOT_SPP.GROWTH_HABIT_CD]

Record the growth habit of the species. Because many species can exhibit more than one growth habit, it is important to note which growth habit each recorded species is demonstrating on each accessible condition within a subplot-condition (the portion of a condition that is located within the boundary of a subplot).

Tally tree species (Only include tree species that are listed in Appendix D, after taking into account the Island, Mainland, and P2/3 Sub-lists (see Item 8.5.1.12, SPECIES (CORE 5.8)) are always recorded as seedling/sapling (SD) and/or large tree (LT) SPECIES GROWTH HABITs, even when they exhibit a shrub-like growth habit in some environments.

Non-tally tree species (tree species not on a particular FIA unit's tree tally list that are woody plants with a single well-defined dominant stem, not supported by other vegetation or structures [not vines], and which are, or are expected to become, greater than 13 feet in height) are recorded as seedling/sapling (SD) and/or large tree (LT) SPECIES GROWTH HABITs when they exhibit a tree-like growth habit; and are recorded as shrub (SH) SPECIES GROWTH HABIT when they exhibit a shrub-like growth habit.

A species may be recorded with a different SPECIES GROWTH HABIT on a different subplot-condition on the same subplot. If a species has more than one growth habit on the same accessible condition in a subplot, record the one SPECIES GROWTH HABIT that is most prevalent within the subplot-condition (except for tally and non-tally tree species as noted next).

For tally and non-tally tree species, both tree SPECIES GROWTH HABITs (SD and LT) are coded for the same species within the same subplot-condition if the species has a total aerial canopy cover of at least 3% in each SPECIES GROWTH HABIT *and it is one of the four most abundant and greater than 3 percent cover.* If a non-tally tree species is exhibiting both tree and shrub form on the subplot-condition, only record the predominant GROWTH HABIT of the species. For example, LT and SH is not a legal combination for the same species in the same condition on the same subplot. It is permissible to record a non-tally tree species as LT on one subplot and SH on another subplot in the same accessible condition, just not within the same subplot-condition. SD and SH is also not a legal combination for the same species in the same condition on the same subplot.

When collected:	For each species recorded	
Field width:	2 alphanumeric characters	
Tolerance:	No errors	
Values:	Code	Description
	SD	Seedlings and Saplings: Small trees less than 5 inches DBH or DRC, including tally and non-tally tree species. Seedlings of any length are included (i.e., no minimum). Up to four species are recorded if individual species total aerial canopy cover is at least 3 percent on the subplot and within the SPECIES GROWTH HABIT.

	SH	Shrubs/Subshrubs/Woody Vines: Woody, multiple-stemmed plants of any size, subshrubs (low-growing shrubs under 1.5 feet tall at maturity), and vines. Most cacti are included in this category. Subshrub species are usually included in this category. However, there are many species that can exhibit either subshrub or forb/herb growth habits. Each FIA region will develop a list of common species that can exhibit either growth habits (according to the NRCS PLANTS database) with regional guidance as to which growth habit the species should normally be assigned, while still allowing species assignments to different growth habits when the species is obviously present in a different growth habit. Up to four species are recorded if individual species totalaerial canopy cover is at least 3 percent on the subplot and within the SPECIES GROWTH HABIT.
	FB	Forbs / Herbaceous, broad-leaved plants; includes non-woody-vines, ferns*, and fern allies* (does not include mosses and cryptobiotic crusts). Up to four species are recorded if individual species total aerial canopy cover is at least 3 percent on the subplot and within the SPECIES GROWTH HABIT.
	GR	Graminoids: Grasses and grass-like plants (includes rushes and sedges). Up to four species are recorded if individual species total aerial canopy cover is at least 3 percent on the subplot and within the SPECIES GROWTH HABIT.
	LT	Large Trees: Large trees greater than or equal to 5 inches DBH or DRC; for LEVEL OF DETAIL = 3, include tally and non-tally tree species. Up to four species of large trees (DBH or DRC at least 5 inches) are recorded if individual species aerial canopy cover is at least 3 percent on the subplot and within the SPECIES GROWTH HABIT.

Item 12.4.0.9 SPECIES VEGETATION LAYER (CORE OPTIONAL 8.5.5)
[P2VEG_SUBPLOT_SPP.LAYER]

For each individual species recorded, assign one of the vegetation layers. These layers illustrate the vertical diversity of the most abundant species found on the subplot.

Assign each plant species record to only one of the vegetation layers per SPECIES GROWTH HABIT per subplot-condition. If a plant species is found in more than one layer, assign the speciesto the layer where most of the canopy cover occurs. If a species occupies multiple layers equally, assign the highest of the equally occupied layers. If a plant has a seed head that grows much taller than the rest of the plant, record the layer that the main part of the plant is in, not the top of the seed head.

When collected:	For each species recorded.	
Field width:	1 digits	
Tolerance:	No errors	
Values:	Code	Description
	1	0 to 2.0 feet
	2	2.1 to 6.0 feet
	3	6.1 to 16.0 feet
	4	Greater than 16 feet

Item 12.4.0.10 SPECIES CANOPY COVER (CORE OPTIONAL 8.5.4)
[P2VEG_SUBPLOT_SPP.COVER_PCT]

For each species recorded, estimate and record the total aerial canopy cover present on the subplot-condition to the nearest 1 percent. Examine each species individually as if the other species do not exist. When recording SPECIES CANOPY COVER for seedlings and saplings (SPECIES GROWTH HABIT = SD), do not include any canopy from trees greater than or equal to 5 inches DBH (DRC for woodland species), regardless of how close to the ground the canopy cover extends. *A* separate estimate is made for the SPECIES CANOPY COVER of trees greater than or equal to 5 inches DBH/DRC (SPECIES GROWTH HABIT = LT).

When collected:	*All species recorded*
Field width:	3 digits
Tolerance:	*+/- 1 class based on the following canopy cover classes* 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%
Values:	001-100

Item 12.4.0.11 VEGETATION SPECIES NOTES (CORE OPTIONAL 8.5.9)
[P2VEG_PLOT_SPECIES.NOTES]

Notes may be entered for any species encountered, but are required for each new species that is not identified. Enter text that describes the species. This text may be used in the specimen label and unknown report.

When collected:	As needed
Field width:	Unlimited alphanumeric character field
Tolerance:	N/A
Values:	English language words, phrases, and numbers

SECTION 12.5 VEGETATION STRUCTURE

In this section, use ocular methods to estimate canopy cover by layer and aerial view coverage for each Structure Growth Habit, and record to the nearest percent (canopy cover >0 and <1% is coded as 1%; i.e., trace amounts are coded as 1%).

Canopy cover by layer:

Estimate the canopy cover in each Structure Growth Habit for each of the four layers. Include Structure Growth Habits with foliage present on the accessible condition and with foliageStructure Growth Habit as if the other growth habits and other layers do not exist. Do not double count overlapping crowns within a Structure Growth Habit; visualize the canopy cover within the layer collapsed into a 2-dimensional space. If a Structure Growth Habit does not have foliage in a layer, enter 0 (do not count tree boles as cover).

Aerial View Coverage:

Determine the total aerial canopy cover by Structure Growth Habit Examine each Structure Growth Habit individually as if the other growth habits do not exist. Do not double-count overlapping crowns within a Structure Growth Habit (maximum cover = the percentage of the subplot area in the accessible condition).

The total aerial canopy cover for a Structure Growth Habit must be equal to or greater than the highest canopy cover recorded for an individual layer in that growth habit, but cannot be greater than the sum of the canopy covers recorded for all the layers in that growth habit.

Vegetation Structure Growth Habits:

Apply the definitions that follow based on the species and appearance of the plants **on the subplot-condition** (i.e. do not put the same species in multiple Structure Growth Habits on the same subplot-condition). Subplot-condition is defined as the portion of a condition that is located within the boundary of a subplot. Include tree species that are listed in Appendix D, after taking into account the Island, Mainland, and P2/3 Sub-lists, as tally tree species growth habit (TT), even if it grows as a shrub in some environments. Woody plants **not** listed in Appendix D, or those on the exclusion list for the area the plot is located in may have a tree growth habit in some environments, and these should be recorded as non-tally tree species (NT). If the growth habit is shrub in another environment, record that species as a shrub (SH). The definitions (adapted from NRCS PLANTS) are:

TT	**Tally Tree Species (TT):** Only include tree species that are listed in Appendix D, (or is a hybrid, variety, or subspecies of a species in Appendix D), after taking into account the Island, Mainland, and P2/3 Sub-lists (see Item 8.5.1.12, SPECIES (CORE 5.8)). Any plant of that species is included, regardless of its shape and regardless of whether it was tallied on the subplot or microplot during tree tally. Seedlings (any length, no minimum), saplings, and mature plants are included.

NT	**Non-tally Tree Species (NT):** These woody plants with a single well-defined, dominant main stem, not supported by other vegetation or structures (not vines), and which are, or are expected to become, greater than 13 feet in height and do not qualify as a tally tree species after taking into account the Island, Mainland, and P2/3 Sub-lists (see Item 8.5.1.12, SPECIES (CORE 5.8)). Seedlings (any length, no minimum), saplings, and mature plants are included.
SH	**Shrubs/Subshrubs/Woody Vines (SH):** Woody, multiple-stemmed plants of any size, subshrubs (low-growing shrubs under 1.5 feet tall at maturity, and woody vines. Most cacti are included in this category.
FB	**Forbs (FB):** Herbaceous, broad-leaved plants; includes non-woody-vines, ferns*, and fern allies* (does not include mosses and cryptobiotic crusts).
GR	**Graminoids (GR):** Grasses and grass-like plants (includes rushes and sedges).

Item 12.5.0.1 CONDITION CLASS NUMBER (CORE OPTIONAL 8.3.2)
[P2VEG_SUBP_STRUCTURE.CONDID]

Record the number for the sampled accessible condition class in which the vegetation is found. If multiple accessible sampled conditions occur on the same subplot, data will be collected for each accessible condition separately.

When collected:	Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS =1)
Field width:	1 digit
Tolerance:	No errors
Values:	1 to 9

Item 12.5.0.2 TALLY TREE SPECIES COVER LAYER 1 (CORE OPTIONAL 8.4.1)
[P2VEG_SUBP_STRUCTURE.TREE_COVER_PCT_LAYER1]

Record canopy cover for all tally tree species in layer 1 (0-2.0 feet) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC.

When Collected:	Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)
Field Width:	3 digits
Tolerance:	+/- 1 class based on the following canopy cover classes 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%
Values:	000-100

Item 12.5.0.3 TALLY TREE SPECIES COVER LAYER 2 (CORE OPTIONAL 8.4.2)
[P2VEG_SUBP_STRUCTURE.TREE_COVER_PCT_LAYER2]

Record canopy cover for all tally tree species in layer 2 (2.1- 6.0 feet) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1.

Item 12.5.0.4 TALLY TREE SPECIES COVER LAYER 3 (CORE OPTIONAL 8.4.3)
[P2VEG_SUBP_STRUCTURE.TREE_COVER_PCT_LAYER3]

Record canopy cover for all tally tree species in layer 3 (6.1- 16.0 feet) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1.

Item 12.5.0.5 TALLY TREE SPECIES COVER LAYER 4 (CORE OPTIONAL 8.4.4)
[P2VEG_SUBP_STRUCTURE.TREE_COVER_PCT_LAYER4]

Record canopy cover for all tally tree species in layer 4 (16.1 feet and above) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1.

Item 12.5.0.6 TALLY TREE SPECIES COVER – AERIAL VIEW (CORE OPTIONAL 8.4.5)
[P2VEG_SUBP_STRUCTURE.TREE_COVER_PCT_AERIAL]

Record the total aerial canopy cover for all tally tree species over all layers. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1, but include all layers.

Item 12.5.0.7 NON-TALLY TREE SPECIES COVER LAYER 1 (CORE OPTIONAL 8.4.6)
[P2VEG_SUBP_STRUCTURE.NONTALLYTREE_COVER_PCT_LAYER1]

Record canopy cover for species **not** on the tally tree species list with tree growth habit in layer 1 (0-2.0 feet) to the nearest percent. Cover includes all non-tally tree species present, regardless of DBH or DRC.

When Collected:	Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)
Field Width:	3 digits
Tolerance:	*+/- 1 class based on the following canopy cover classes* 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%
Values:	000-100

Item 12.5.0.8 NON-TALLY TREE SPECIES COVER LAYER 2 (CORE OPTIONAL 8.4.7)
[P2VEG_SUBP_STRUCTURE.NONTALLYTREE_COVER_PCT_LAYER2]

Record canopy cover for species **not** on the tally tree species list with tree growth form in layer 2 (2.1- 6.0 feet) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1.

Item 12.5.0.9 NON-TALLY TREE SPECIES COVER LAYER 3 (CORE OPTIONAL 8.4.8)
[P2VEG_SUBP_STRUCTURE.NONTALLYTREE_COVER_PCT_LAYER3]

Record canopy cover for species **not** on the tally tree species list with tree growth form in layer 3 (6.1- 16.0 feet) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1.

Item 12.5.0.10 NON-TALLY TREE SPECIES COVER LAYER 4 (CORE OPTIONAL 8.4.9)
[P2VEG_SUBP_STRUCTURE.NONTALLYTREE_COVER_PCT_LAYER4]

Record a total aerial canopy cover for species **not** on the tally tree species list with tree growth habit in layer 4 (16.1 feet and above) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1.

Item 12.5.0.11 NON-TALLY TREE SPECIES COVER – AERIAL VIEW (CORE OPTIONAL 8.4.10)
[P2VEG_SUBP_STRUCTURE.NONTALLYTREE_COVER_PCT_AERIAL]

Record the total aerial canopy cover for species **not** on the tally tree species list with tree growth habit over all layers. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1, but include all layers.

Item 12.5.0.12 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1 (CORE OPTIONAL 8.4.11)
[P2VEG_SUBP_STRUCTURE.SHRUB_VINE_COVER_PCT_LAYER1]

Record canopy cover for shrubs/subshrubs/woody vines in layer 1 (0-2.0 feet) to the nearest percent.

When collected:	Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)
Field width:	3 digits
Tolerance:	*+/- 1 class based on the following canopy cover classes* 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%
Values:	000-100

Item 12.5.0.13 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 2 (CORE OPTIONAL 8.4.12)
[P2VEG_SUBP_STRUCTURE.SHRUB_VINE_COVER_PCT_LAYER2]

Record canopy cover for shrubs/subshrubs/woody vines in layer 2 (2.1-6.0 feet) to the nearest percent. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1.

Item 12.5.0.14 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 3 (CORE OPTIONAL 8.4.13)
[P2VEG_SUBP_STRUCTURE.SHRUB_VINE_COVER_PCT_LAYER3]

Record canopy cover for shrubs/subshrubs/woody vines in layer 3 (6.1-16.0 feet) to the nearest percent. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1.

Item 12.5.0.15 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 4 (CORE OPTIONAL 8.4.14)
[P2VEG_SUBP_STRUCTURE.SHRUB_VINE_COVER_PCT_LAYER4]

Record canopy cover for shrubs/subshrubs/woody vines in layer 4 (16.1 feet and above) to the nearest percent. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1.

Item 12.5.0.16 SHRUB, SUBSHRUB, AND WOODY VINE COVER—AERIAL VIEW (CORE OPTIONAL 8.4.15)
[P2VEG_SUBP_STRUCTURE.SHRUB_VINE_COVER_PCT_AERIAL]

Record the total aerial canopy cover for the shrub/subshrub/woody vine growth habit over all layers. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1, but include all layers.

Item 12.5.0.17 FORB COVER LAYER 1 (CORE OPTIONAL 8.4.16)
[P2VEG_SUBP_STRUCTURE.FORB_COVER_PCT_LAYER1]

Record canopy cover for forbs in layer 1 (0-2.0 feet) to the nearest percent.

When collected:	Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)
Field width:	3 digits
Tolerance:	*+/- 1 class based on the following canopy cover classes* 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%
Values:	000-100

Item 12.5.0.18 FORB COVER LAYER 2 (CORE OPTIONAL 8.4.17)
[P2VEG_SUBP_STRUCTURE.FORB_COVER_PCT_LAYER2]

Record canopy cover for forbs in layer 2 (2.1-6.0 feet) to the nearest percent. Follow the same procedures as for FORB COVER LAYER 1.

Item 12.5.0.19 FORB COVER LAYER 3 (CORE OPTIONAL 8.4.18)
[P2VEG_SUBP_STRUCTURE.FORB_COVER_PCT_LAYER3]

Record canopy cover for forbs in layer 3 (6.1-16.0 feet) to the nearest percent. Follow the same procedures as for FORB COVER LAYER 1.

Item 12.5.0.20 FORB COVER LAYER 4 (CORE OPTIONAL 8.4.19)
[P2VEG_SUBP_STRUCTURE.FORB_COVER_PCT_LAYER4]

Record canopy cover for forbs in layer 4 (16.1 feet and above) to the nearest percent. Follow the same procedures as for FORB COVER LAYER 1.

Item 12.5.0.21 FORB COVER—AERIAL VIEW (CORE OPTIONAL 8.4.20)
[P2VEG_SUBP_STRUCTURE.FORB_COVER_PCT_AERIAL]

Record the total aerial canopy cover for the forb growth habit over all layers. Follow the same procedures as for FORB COVER LAYER, but include all layers.

Item 12.5.0.22 GRAMINOID COVER LAYER 1 (CORE OPTIONAL 8.4.21)
[P2VEG_SUBP_STRUCTURE.GRAMINOID_COVER_PCT_LAYER1]

Record canopy cover for graminoids in layer 1 (0-2.0 feet) to the nearest percent.

When collected:	Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)
Field width:	3 digits
Tolerance:	*+/- 1 class based on the following canopy cover classes 1*%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%
Values:	000-100

Item 12.5.0.23 GRAMINOID COVER LAYER 2 (CORE OPTIONAL 8.4.22)
[P2VEG_SUBP_STRUCTURE.GRAMINOID_COVER_PCT_LAYER2]

Record canopy cover for graminoids in layer 2 (2.1-6.0 feet) to the nearest percent. Follow the same procedures as for GRAMINOID COVER LAYER 1.

Item 12.5.0.24 GRAMINOID COVER LAYER 3 (CORE OPTIONAL 8.4.23)
[P2VEG_SUBP_STRUCTURE.GRAMINOID_COVER_PCT_LAYER3]

Record canopy cover for graminoids in layer 3 (6.1-16.0 feet) to the nearest percent. Follow the same procedures as for GRAMINOID COVER LAYER 1.

Item 12.5.0.25 GRAMINOID COVER LAYER 4 (CORE OPTIONAL 8.4.24)
[P2VEG_SUBP_STRUCTURE.GRAMINOID_COVER_PCT_LAYER4]

Record canopy cover for graminoids in layer 4 (16.1 feet and above) to the nearest percent. Follow the same procedures as for GRAMINOID COVER LAYER 1.

Item 12.5.0.26 GRAMINOID COVER—AERIAL VIEW (CORE OPTIONAL 8.4.25)
[P2VEG_SUBP_STRUCTURE.GRAMINOID_COVER_PCT_AERIAL]

Record the total aerial canopy cover for the graminoid growth habit over all layers. Follow the same procedures as for GRAMINOID COVER LAYER 1, but include all layers.

CHAPTER 13 INDICATOR SPECIES ON REGION 6 AND WESTERN OREGON BLM LANDS

SECTION 13.1 INDICATOR SPECIES ON R6 AND WESTERN OREGON BLM LANDS

Plant associations have been developed for Region 6 Forest Service administered lands which are useful for ecological and management purposes. Plant associations are consistent groups of vascular plant species (i.e., plant communities) that occur in climax forests. Some species are reliable "indicators" for one or more plant associations. Forest Service botanists and ecologists find that having the cover data for these species, in addition to the condition-level plant association code (Item 5.7.2.71, PLANT ASSOCIATION (PFSL)), allows them to assess community conditions in greater depth.

Indicator species are recorded on any sampled accessible subplot on Region 6 Forest Service administered land or within the Western Oregon BLM timberland inventory area. Lists of indicator species have been created for groups of National Forests and BLM Resource Areas and are found in Appendix A, Plots on Forest Service and BLM Lands. Plant identification guides have been developed for the species on these lists and should be available to every crew (guides are cited at the beginning of each list). Standard Phase 2 field crews (i.e., those without specific training and materials) must look for the plants identified specifically as forest "indicators" for no more than 10 minutes on each subplot, coding all species they can in that amount of time, regardless of abundance. The "nonforest", "weed", and "sensitive" plant species can also be recorded if crews recognize them, but are intended for inventory by botanists with specific training.

Item 13.1.0.1 SUBPLOT NUMBER (PFSL)
[VEG_PLOT_SPECIES_PNWRS.SUBP]

This is a generated code corresponding to the number of the subplot.

When collected:	All subplots when P2 VEG SUBPLOT SAMPLE STATUS = 1 and ADMINISTRATIVE FOREST CODE = 601-699, or OWNER CLASS = 22 and BLM RESOURCE AREA = not null, for SUBPLOT/MACROPLOT CENTER CONDITION.	
Field width:	1 digit	
Tolerance:	No errors	
Values:	Code	Subplot location
	1	Center subplot
	2	North subplot
	3	Southeast subplot
	4	Southwest subplot

Item 13.1.0.2 SPECIES (PFSL)
[VEG_PLOT_SPECIES_PNWRS.VEG_FLD_SPCD]

Record the accepted NRCS species code for any species included on the Region 6 and BLM Resource Area Plant Indicator list (Appendix A) for the National Forest or BLM Resource Area being sampled.

When collected:	All accessible subplots where listed species are observed
Field width:	10 alpha-numeric characters
Tolerance:	No errors
Values:	See Appendix A.3 for species codes

Item 13.1.0.3 SPECIES CANOPY COVER (PFSL)
[VEG_PLOT_SPECIES_PNWRS.SUBP_(1,2,3,4)_CVR_PCT]

A rapid canopy cover estimate is made for each listed species across all layer heights. Canopy cover is based on a vertically-projected polygon described by the outline of the foliage, ignoring any normal spaces occurring between the leaves of the plant (Daubenmire 1959). Canopy cover is estimated as a percentage of the entire 24-foot radius subplot. In cases where the subplot is not fully accessible (access denied, hazardous, water, etc.), record the percentage of cover on the accessible portions as if the subplot was entirely accessible. That is, if cover is about equal to a circle with a radius of 5.3 feet, enter 5 percent, as you would for a fully forested subplot, on any partially forested subplot.

If percentage of cover is greater than zero but less than 1 percent, enter 1. For species of moderate cover, it may be easiest to divide the subplots into quarters, estimate canopy cover of each quarter separately, and then add them together. The following area-cover sizes may be useful in developing estimates for an entirely forested subplot:

Table 13.1: Area represented by different cover estimates

Subplot radius = 24 feet			
Subplot area = 1,809 feet^2			
Cover	Area (feet^2)	Length on a side of a square (feet)	Radius of a circular area (feet)
1%	18	4.3	2.4
3%	54	7.4	4.1
5%	90	9.5	5.3
10%	181	13.4	7.6
20%	362	19.0	10.7

When collected:	All species records
Field width:	3 digits
Tolerance:	+/- one class based on the following canopy cover classes: 0-1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, and 96-100%
Values:	001 to 100

APPENDIX A PLOTS ON FOREST SERVICE AND BLM LANDS

SECTION A.1 REGION 1 AND REGION 4 REFERENCE INFORMATION FOR FIA PLOTS ON FOREST SERVICE ADMINISTERED LANDS

SUBSECTION A.1.1 REGION 1 (R1) PLOT MEASUREMENT RULES

Plots on R1 Forest Service administered lands (e.g., Idaho Panhandle N.F.) are measured like all other plots not on R5 and R6 Forest Service administered lands (i.e., no special protocols are applied). See Subsection 2.3.2 (Region 1 and Region 4 Plots) for more information about plots in Region 1.

SUBSECTION A.1.2 REGION 4 (R4) PLOT MEASUREMENT RULES

Plots on R4 Forest Service administered lands (e.g., Toiyabe N.F.) are measured like all other plots not on R5 and R6 Forest Service administered lands (i.e., no special protocols are applied). See Subsection 2.3.2 (Region 1 and Region 4 Plots) for more information on plots in Region 4.

SECTION A.2 REFERENCE INFORMATION FOR FIA PLOTS ON R5 FOREST SERVICE ADMINISTERED LANDS

SUBSECTION A.2.1 REGION 5 (R5) SURVEY TREE SPECIES CODES AND CURRENT PNW-FIA TREE SPECIES CODE EQUIVALENT

R5 Code	Species	Scientific name	PNW Code
1	Douglas-fir	*Pseudotsuga menziesii*	202
2	Bigcone Douglas-fir	*Pseudotsuga macrocarpa*	201
5	Redwood	*Sequoia sempervirens*	211
6	Giant sequoia	*Sequoiadendron giganteum*	212
11	Ponderosa pine	*Pinus ponderosa*	122
12	Jeffrey pine	*Pinus jeffreyi*	116
13	Sugar pine	*Pinus lambertiana*	117
14	Western white pine	*Pinus monticola*	119
15	Lodgepole pine	*Pinus contorta*	108
19	Washoe pine	*Pinus washoensis*	137
21	Coulter pine	*Pinus coulteri*	109
22	Monterey pine	*Pinus radiata*	124
23	Gray pine (digger pine)	*Pinus sabiniana*	127
24	Knobcone pine	*Pinus attenuata*	103
25	Bishop pine	*Pinus muricata*	120
26	Whitebark pine	*Pinus albicaulis*	101
27	Singleleaf pinyon	*Pinus monophylla*	133
28	Bristlecone pine	*Pinus aristata*	102
29	Limber pine	*Pinus flexilis*	113
30	Foxtail pine	*Pinus balfouriana*	104
31	White fir	*Abies concolor*	15
32	Red fir	*Abies magnifica*	20
33	Grand fir	*Abies grandis*	17
34	Bristlecone fir	*Abies brackteata*	14
35	Noble fir	*Abies procera*	22
37	Subalpine fir	*Abies lasiocarpa*	19
39	Pacific silver fir	*Abies amabilis*	11
42	Sitka spruce	*Picea sitchensis*	98
45	Baker cypress	*Cupressus bakeri ssp. bakeri*	52
46	Brewer spruce	*Picea breweriana*	92
47	Mountain hemlock	*Tsuga mertensiana*	264

R5 Code	Species	Scientific name	PNW Code
48	Western hemlock	*Tsuga heterophylla*	263
51	Incense-cedar	*Calocedrus decurrens*	81
52	Alaska yellow cedar	*Chamaecyparis nootkatensis*	42
53	Port-Orford-cedar	*Chamaecyparis lawsoniana*	41
54	Western red-cedar	*Thuja plicata*	242
57	Monterey cypress	*Cupressus macrocarpa*	54
58	Tecate cypress	*Cupressus forbesii*	53
59	MacNab cypress	*Cupressus macnabiana*	56
61	California-nutmeg	*Torreya californica*	251
62	Pacific yew	*Taxus brevifolia*	231
63	Western juniper	*Juniperus occidentalis*	64
64	Cypress	*Cupressus sp.*	none
65	Utah juniper	*Juniperus osteosperma*	65
66	California juniper	*Juniperus californica*	62
68	Other conifers		
70	California buckeye	*Aesculus californica*	333
71	Red alder	*Alnus oregona (rubra)*	351
72	Ash	*Fraxinus sp.*	none
73	Aspen	*Populus tremuloides*	746
74	White alder	*Alnus rhombifolia*	352
75	Black cottonwood	*Populus trichocarpa*	747
76	Bigleaf maple	*Acer macrophyllum*	312
77	Tree of Heaven	*Ailanthus altissima*	341
78	Fremont cottonwood	*Populus fremontii*	748
79	Engelmann oak	*Quercus engelmanni*	811
80	Unknown oak sp.	*Quercus sp.*	none
81	California black oak	*Quercus kelloggii*	818
82	Coast live oak	*Quercus agrifolia*	801
83	California white (valley) oak	*Quercus lobata*	821
84	Canyon live oak	*Quercus chrysolepis*	805
85	Interior live oak	*Quercus wislizenii*	839
86	Oregon white oak	*Quercus garryana*	815
87	Tanoak	*Notholithocarpus densiflorus*	631
88	Blue oak	*Quercus douglassii*	807
89	Willow sp.	*Salix sp.*	none
90	Walnut sp.	*Juglans sp.*	none
91	California-laurel	*Umbellularia californica*	981
92	California boxelder	*Acer negundo californicum*	313
93	Giant chinquapin	*Castanopsis chrysophylla*	431
94	Madrone	*Arbutus menziesii*	361
95	Pacific dogwood	*Cornus nuttallii*	492
96	Sycamore	*Platanus racemosa*	730
97	Eucalyptus sp.	*Eucalyptus sp.*	none
98	Other hardwoods		

SUBSECTION A.2.2 R5 CHAPARRAL RULES

Chaparral is measured like all other nonforest conditions on R5 Forest Service administered lands (i.e., there are no special rules for chaparral in R5).

SECTION A.3 REFERENCE INFORMATION FOR FIA PLOTS ON R6 FOREST SERVICE AND WESTERN OREGON BLM LANDS

SUBSECTION A.3.1 REGION 6 (R6) AND WESTERN OREGON BLM PLANT INDICATOR LISTS

Most national forests have produced illustrated guides to identify forest indicator ("indi") species and to distinguish them from related species; they are listed below for each ecological zone. Some species, defined as "trees" by PNW-FIA, are sampled using normal tree tally procedures, and are included on the list as reference only because they appear as "shrubs" in the R6 guides. The "R6 old species" names and codes are those found in the plant association guides for the respective forests. Within each zone's list, species are grouped first by use, and secondarily by PLANTS species name.

Species are listed in four categories of "use":

indi: indicator species for forested plant associations-recorded only when 50 percent or more of a subplot is in a forested condition class,

nfor: indicator species for nonforest plant associations (either completed or in development)-recorded only when 50 percent or more of a subplot is in a nonforest condition class,

weed: noxious or invasive plants of special interest-recorded on all conditions, and

sens: usually rare species that are believed to be sensitive to management-recorded on all conditions.

SUBSECTION A.3.2 NW OREGON

Mt. Hood, Siuslaw, and Willamette National Forests; Umpqua (ORC03), Cascade (ORN01), Mary's Peak (ORN02), Siuslaw (ORN03), Tillamook (ORN04), Upper Willamette (ORN05) BLM Resource Areas

ID Guide: Halverson, Nancy M. 1986. Major Indicator Shrubs and Herbs on National Forests of Western Oregon and Southwestern Washington. USDA Forest Service, Pacific Northwest Region R6-TM-229-1986.

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
CHCHC4	*Chrysolepis chrysophylla var. chrysophylla*	indi	tree	CACH	*Castanopsis chrysophylla*	Golden Chinquapin
ACCI	*Acer circinatum*	indi	shrub	ACCI	*Acer circinatum*	vine maple
AMAL2	*Amelanchier alnifolia*	indi	shrub	AMAL	*Amelanchier alnifolia*	Saskatoon serviceberry
ARNE	*Arctostaphylos nevadensis*	indi	shrub	ARNE	*Arctostaphylos nevadensis*	pinemat manzanita
ARUV	*Arctostaphylos uva-ursi*	indi	shrub	ARUV	*Arctostaphylos uva-ursi*	Bearberry, kinnikinnick
CHUM	*Chimaphila umbellata*	indi	shrub	CHUM	*Chimaphila umbellata*	Prince's pine
COCO6	*Corylus cornuta*	indi	shrub	COCO2	*Corylus cornuta*	California hazel
GASH	*Gaultheria shallon*	indi	shrub	GASH	*Gaultheria shallon*	salal
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
JUCO6	*Juniperus communis*	indi	shrub	JUCO4	*Juniperus communis*	common juniper
MAAQ2	*Mahonia aquifolium*	indi	shrub	BEAQ	*Berberis aquifolium*	tall Oregon grape
MANE2	*Mahonia nervosa*	indi	shrub	BENE	*Berberis nervosa*	Oregon grape
MEFE	*Menziesia ferruginea*	indi	shrub	MEFE	*Menziesia ferruginea*	fool's huckleberry
OPHO	*Oplopanax horridus*	indi	shrub	OPHO	*Oplopanax horridus*	devil's club
PHEM	*Phyllodoce empetriformis*	indi	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
PUTR2	*Purshia tridentata*	indi	shrub	PUTR	*Purshia tridentata*	bitterbrush
RHAL2	*Rhododendron albiflorum*	indi	shrub	RHAL	*Rhododendron albiflorum*	cascades azalea
RHMA3	*Rhododendron macrophyllum*	indi	shrub	RHMA	*Rhododendron macrophyllum*	Pacific rhododendron
RUPA	*Rubus parviflorus*	indi	shrub	RUPA	*Rubus parviflorus*	thimbleberry
RUSP	*Rubus spectabilis*	indi	shrub	RUSP	*Rubus spectabilis*	salmonberry
RUUR	*Rubus ursinus*	indi	shrub	RUUR	*Rubus ursinus*	Pacific blackberry
SYAL	*Symphoricarpos albus*	indi	shrub	SYAL	*Symphoricarpos albus*	common snowberry
SYHE	*Symphoricarpos hesperius*	indi	shrub	SYMO	*Symphoricarpos mollis*	trailing snowberry
TODI	*Toxicodendron diversilobum*	indi	shrub	RHDI	*Rhus diversiloba*	poison oak
VADE	*Vaccinium deliciosum*	indi	shrub	VADE	*Vaccinium deliciosum*	delicious blueberry
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAAL	*Vaccinium alaskense*	Alaska huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAOV	*Vaccinium ovalifolium*	oval-leaf huckleberry
VAOV2	*Vaccinium ovatum*	indi	shrub	VAOV2	*Vaccinium ovatum*	evergreen huckleberry
WHMO	*Whipplea modesta*	indi	shrub	WHMO	*Whipplea modesta*	whipplevine
ACRU2	*Actaea rubra*	indi	forb	ACRU	*Actaea rubra*	baneberry
ACTR	*Achlys triphylla*	indi	forb	ACTR	*Achlys triphylla*	vanilla leaf
ADAL	*Adiantum aleuticum*	indi	forb	ADPE	*Adiantum pedatum*	maidenhar fern
ADBI	*Adenocaulon bicolor*	indi	forb	ADBI	*Adenocaulon bicolor*	trail plant
ASCA2	*Asarum caudatum*	indi	forb	ASCA3	*Asarum caudatum*	wild ginger
ATFI	*Athyrium filix-femina*	indi	forb	ATFI	*Athyrium filix-femina*	common ladyfern
BASA3	*Balsamorhiza sagittata*	indi	forb	BASA	*Balsamorhiza sagittata*	arrowleaf balsamroot
BLSP	*Blechnum spicant*	indi	forb	BLSP	*Blechnum spicant*	deer fern
CLDO2	*Clinopodium douglasii*	indi	forb	SADO	*Satureja douglasii*	yerba buena
CLSI2	*Claytonia sibirica*	indi	forb	MOSI	*Claytonia sibirica*	miner's lettuce

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly
COCA13	*Cornus canadensis*	indi	forb	COCA	*Cornus canadensis*	bunchberry
DRCA11	*Dryopteris carthusiana*	indi	forb	DRAU2	*Dryopteris campyloptera*	shield-fern
ERMO8	*Erythronium montanum*	indi	forb	ERMO	*Erythronium montanum*	avalanche lily/giant faw
EULEL2	*Eucephalus ledophyllus var. ledophyllus*	indi	forb	ASLE2	*Aster ledophyllus*	Cascades aster
FRAGA	*Fragaria sp.*	indi	forb	FRAGA	*Fragaria sp.*	strawberry species
FRVE	*Fragaria vesca*	indi	forb	FRVE	*Fragaria vesca*	woodland strawberry
HIAL2	*Hieracium albiflorum*	indi	forb	HIAL	*Hieracium albiflorum*	White Hawkweed
LAPO3	*Lathyrus polyphyllus*	indi	forb	LAPO	*Lathyrus polyphyllus*	leafy pea vine
LIBO3	*Linnaea borealis*	indi	forb	LIBO2	*Linnaea borealis*	twinflower
LYAM3	*Lysichiton americanus*	indi	forb	LYAM	*Lysichiton americanum*	skunk cabbage
MADI	*Maianthemum dilatatum*	indi	forb	MADI2	*Maianthemum dilatatum*	false lily of the vally
MARA7	*Maianthemum racemosum*	indi	forb	SMRA	*Smilacina racemosa*	false Solomon's seal
MAST4	*Maianthemum stellatum*	indi	forb	SMST	*Smilacina stellata*	starry Solomon's seal
MOMA3	*Moehringia macrophylla*	indi	forb	ARMA3	*Arenaria macrophylla*	bigleaf sandwort
OSBE	*Osmorhiza berteroi*	indi	forb	OSCH	*Osmorhiza chilensis*	sweet cicely
OXOR	*Oxalis oregana*	indi	forb	OXOR	*Oxalis oregana*	Oregon oxalis
PODA	*Polygonum davisiae*	indi	forb	PONE4	*Polygonum newberryi*	Newberry's fleeceflower
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
POPU3	*Polemonium pulcherrimum*	indi	forb	POPU	*Polemonium pulcherrimum*	Jacob's ladder
STLAC	*Streptopus lanceolatus var. curvipes*	indi	forb	STRO	*Streptopus roseus*	rosy twistedstalk
STME	*Stachys mexicana*	indi	forb	STME2	*Stachys mexicana*	Mexican hedgenettle
SYRE	*Synthyris reniformis*	indi	forb	SYRE	*Synthyris reniformis*	snowqueen
TITR	*Tiarella trifoliata*	indi	forb	TITR	*Tiarella trifoliata*	threeleaf foamflower
TRBOL	*Trientalis borealis ssp. latifolia*	indi	forb	TRLA2	*Trientalis latifolia*	western starflower
VAHE	*Vancouveria hexandra*	indi	forb	VAHE	*Vancouveria hexandra*	white inside-out-flower
XETE	*Xerophyllum tenax*	indi	forb	XETE	*Xerophyllum tenax*	beargrass
CAGE2	*Carex geyeri*	indi	grami	CAGE	*Carex geyeri*	elk sedge
FEOC	*Festuca occidentalis*	indi	grami	FEOC	*Festuca occidentalis*	western fescue
FEVI	*Festuca viridula*	indi	grami	FEVI	*Festuca viridula*	green fescue
LUZUL	*Luzula sp.*	indi	grami	LUZUL	*Luzula sp.*	woodrush

SUBSECTION A.3.3 SW OREGON

Rogue River, Siskyou, and Umpqua National Forests; Myrtlewood (ORC04), Butte Falls (ORM05), Ashland (ORM06), Grants Pass (ORM07), Swiftwater (ORR04), South River (ORR05) BLM Resource Areas

ID Guide: Seda, Anita, Thomas Atzet, and David Wheeler. 1989 (updated 1997). Key Species for Plant Associations on the Rogue River, Siskiyou, and Umpqua National Forests. USDA Forest Service, Pacific Northwest Region R6-NR-ECOL-TP-026-97.

PLANTS	*PLANTS species*	Use	form	R6code	*R6 old species*	common_name
CHCHC4	*Chrysolepis chrysophylla var. chrysophylla*	indi	tree	CACH	*Castanopsis chrysophylla*	golden chinquapin
NODEE	*Notholithocarpus densiflora var. echinoides*	indi	tree	LIDEE	*Lithocarpus densiflora echinoides*	tanoak (shrub form)
ACCI	*Acer circinatum*	indi	shrub	ACCI	*Acer circinatum*	vine maple
ACGLD4	*Acer glabrum var. Douglasii*	indi	shrub	ACGLD	*Acer glabrum var. Douglasii*	Douglas maple
ARCA5	*Arctostaphylos canescens*	indi	shrub	ARCA5	*Arctostaphylos canescens*	hoary manzanita
ARCO3	*Arctostaphylos columbiana*	indi	shrub	ARCO3	*Arctostaphylos columbiana*	hairy manzanita
ARCTO3	*Arctostaphylos spp.*	indi	shrub	ARCTO	*Arctostaphylos spp.*	arctostaphylos spp.
ARNE	*Arctostaphylos nevadensis*	indi	shrub	ARNE	*Arctostaphylos nevadensis*	pinemat manzanita
ARPA6	*Arctostaphylos patula*	indi	shrub	ARPA	*Arctostaphylos patula*	greenleaf manzanita
ARVI4	*Arctostaphylos viscida*	indi	shrub	ARVI	*Arctostaphylos viscida*	whiteleaf manzanita
CECU	*Ceanothus cuneatus*	indi	shrub	CECU	*Ceanothus cuneatus*	buckbrush
CEIN3	*Ceanothus integerrimus*	indi	shrub	CEIN	*Ceanothus intergerrimus*	deerbrush
CEPR	*Ceanothus prostratus*	indi	shrub	CEPR	*Ceanothus prostratus*	prostrate ceanothus
CEPU	*Ceanothus pumilus*	indi	shrub	CEPU	*Ceanothus pumilus*	dwarf ceanothus
CETH	*Ceanothus thyrsiflorus*	indi	shrub	CETH	*Ceanothus thyrsiflorus*	blue blossom ceanothus
CEVE	*Ceanothus velutinus*	indi	shrub	CEVE	*Ceanothus velutinus*	snowbrush ceanothus
CHME	*Chimaphila menziesii*	indi	shrub	CHME	*Chimaphila menziesii*	little prince’s-pine
CHUM	*Chimaphila umbellata*	indi	shrub	CHUM	*Chimaphila umbellata*	prince's pine
COCOC	*Corylus cornuta var. californica*	indi	shrub	COCOC	*Corylus cornuta californica*	California hazel
FRCA12	*Frangula californica*	indi	shrub	RHCA	*Rhamnus californica*	coffeeberry
FRPU7	*Frangula purshiana*	indi	shrub	RHPU	*Rhamnus purshiana*	cascara
GABU2	*Garrya buxifolia*	indi	shrub	GABU	*Garrya buxifolia*	box-leaved silk-tassel
GAOV2	*Gaultheria ovatifolia*	indi	shrub	GAOV	*Gaultheria ovatifolia*	slender salal
GASH	*Gaultheria shallon*	indi	shrub	GASH	*Gaultheria shallon*	salal
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
LEDA	*Leucothoe davisiae*	indi	shrub	LEDA	*Leucothoe davisiae*	Sierra-laurel
LOHI2	*Lonicera hispidula*	indi	shrub	LOHI	*Lonicera hispidula*	hairy honeysuckle
MAAQ2	*Mahonia aquifolium*	indi	shrub	BEPI	*Berberis piperiana*	Piper’s Oregon grape
MANE2	*Mahonia nervosa*	indi	shrub	BENE	*Berberis nervosa*	Oregon grape
MARE11	*Mahonia repens*	indi	shrub	BERE	*Berberis repens*	creeping Oregon grape
ORSE	*Orthilia secunda*	indi	subshrub	PYSE	*Pyrola secunda*	Sidebells pyrola
PAMY	*Paxistima myrsinites*	indi	shrub	PAMY	*Pachistima myrsinites*	Oregon boxwood
QUSA2	*Quercus sadleriana*	indi	shrub	QUSA	*Quercus sadleriana*	Sadler oak
QUVA	*Quercus vaccinifolia*	indi	shrub	QUVA	*Quercus vaccinifolia*	huckleberry oak
RHMA3	*Rhododendron macrophyllum*	indi	shrub	RHMA	*Rhododendron macrophyllum*	Pacific rhododendron
RHOC	*Rhododendron occidentale*	indi	shrub	RHOC	*Rhododendron occidentale*	western azalea
RIBI	*Ribes binominatum*	indi	shrub	RIBI	*Ribes binominatum*	Siskiyou gooseberry

PLANTS	*PLANTS species*	Use	form	R6code	*R6 old species*	common_name
RICE	*Ribes cereum*	indi	shrub	RICE	*Ribes cereum*	wax current
RICR	*Ribes cruentum*	indi	shrub	RICR	*Ribes cruentum*	shinyleaf gooseberry
RILA	*Ribes lacustre*	indi	shrub	RILA	*Ribes lacustre*	prickly currant
RILO	*Ribes lobbii*	indi	shrub	RILO	*Ribes lobbii*	gummy gooseberry
RIMA2	*Ribes marshallii*	indi	shrub	RIMA	*Ribes marshallii*	Applegate gooseberry
RISA	*Ribes sanguineum*	indi	shrub	RISA	*Ribes sanguineum*	red currant
RIVI3	*Ribes viscossissimum*	indi	shrub	RIVI	*Ribes viscossissimum*	sticky currant
ROGY	*Rosa gymnocarpa*	indi	shrub	ROGY	*Rosa gymnocarpa*	baldhip rose
RULA2	*Rubus lasiococcus*	indi	shrub	RULA	*Rubus lasiococcus*	dwarf bramble
RUNI2	*Rubus nivalis*	indi	shrub	RUNI	*Rubus nivalis*	snow bramble
RUSP	*Rubus spectabilis*	indi	shrub	RUSP	*Rubus spectabilis*	salmonberry
RUUR	*Rubus ursinus*	indi	shrub	RUUR	*Rubus ursinus*	Pacific blackberry
SYHE	*Symphoricarpos hesperius*	indi	shrub	SYMO	*Symphoricarpos mollis*	trailing snowberry
TODI	*Toxicodendron diversilobum*	indi	shrub	RHDI	*Rhus diversiloba*	poison oak
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VAOV2	*Vaccinium ovatum*	indi	shrub	VAOV2	*Vaccinium ovatum*	evergreen huckleberry
VAPA	*Vaccinium parvifolium*	indi	shrub	VAPA	*Vaccinium parvifolium*	red huckleberry
VASC	*Vaccinium scoparium*	indi	shrub	VASC	*Vaccinium scoparium*	grouse huckleberry
WHMO	*Whipplea modesta*	indi	shrub	WHMO	*Whipplea modesta*	whipplevine
ACMI2	*Achillea millefolium*	indi	forb	ACMI	*Achillea millefolium*	western yarrow
ACRU2	*Actaea rubra*	indi	forb	ACRU	*Actaea rubra*	baneberry
ACTR	*Achlys triphylla*	indi	forb	ACTR	*Achlys triphylla*	vanilla leaf
ADBI	*Adenocaulon bicolor*	indi	forb	ADBI	*Adenocaulon bicolor*	trail plant
ANDE3	*Anemone deltoidea*	indi	forb	ANDE	*Anemone deltoidea*	threeleaf anemone
APAN2	*Apocynum androsaemifolium*	indi	forb	APAN	*Apocynum androsaemifolium*	spreading dogbane
ARCO9	*Arnica cordifolia*	indi	forb	ARCO	*Arnica cordifolia*	heart-leaf arnica
ARLA8	*Arnica latifolia*	indi	forb	ARLA	*Arnica latifolia*	broadleaf arnica
ASDE6	*Aspidotis densa*	indi	forb	ASDE	*Aspidotis densa*	rock fern
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly
CYGR	*Cynoglossum grande*	indi	forb	CYGR	*Cynoglossum grande*	Pacific hound’s-tongue
EQAR	*Equisetum arvense*	indi	forb	EQAR	*Equisetum arvense*	Common horsetail
ERUM	*Eriogonum umbellatum*	indi	forb	ERUM	*Eriogonum umbellatum*	sulphurflower
FRVEB2	*Fragaria vesca ssp. bracteata*	indi	forb	FRVEB3	*Fragaria vesca bracteata*	woods strawberry
GAAM2	*Galium ambiguum*	indi	forb	GAAM	*Galium ambiguum*	obscure bedstraw
GAAP2	*Galium aparine*	indi	forb	GAAP	*Galium aparine*	catchweed bedstraw
GAOR	*Galium oreganum*	indi	forb	GAOR	*Galium oreganum*	Oregon bedstraw
GATR3	*Galium triflorum*	indi	forb	GATR	*Galium triflorum*	sweetscented bedstraw
GOOB2	*Goodyera oblongifolia*	indi	forb	GOOB	*Goodyera oblongifolia*	western rattlesnake-plantain
HIAL2	*Hieracium albiflorum*	indi	forb	HIAL	*Hieracium albiflorum*	White Hawkweed
LIBOL2	*Linnaea borealis ssp. longiflora*	indi	forb	LIBOL	*Linnaea borealis longiflora*	western twinflower
MAMA	*Madia madioides*	indi	forb	MAMA	*Madia madioides*	woodland tarweed
MARA7	*Maianthemum racemosum*	indi	forb	SMRA	*Smilacina racemosa*	False Solomon's seal
MAST4	*Maianthemum stellatum*	indi	forb	SMST	*Smilacina stellata*	starry Solomon's seal
MITR4	*Mitella trifida*	indi	forb	MITR2	*Mitella trifida*	three-tooth mitrewort
MOOD	*Monardella odoratissima*	indi	forb	MOOD	*Monardella odoratissima*	mountain balm
OSBE	*Osmorhiza berteroi*	indi	forb	OSCH	*Osmorhiza chilensis*	sweet cicely

PLANTS	*PLANTS species*	Use	form	R6code	*R6 old species*	common_name
OSPU	*Osmorhiza purpurea*	indi	forb	OSPU	*Osmorhiza purpurea*	purple sweet-root
OXOR	*Oxalis oregana*	indi	forb	OXOR	*Oxalis oregana*	Oregon oxalis
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
POPU3	*Polemonium pulcherrimum*	indi	forb	POPU	*Polemonium pulcherrimum*	Jacob's ladder
PRHO2	*Prosartes hookeri*	indi	forb	DIHOO	*Disporum hookeri oreganum*	Oregon fairybell
PTAQ	*Pteridium aquilinum*	indi	forb	PTAQ	*Pteridium aquilinum*	bracken fern
PYAS	*Pyrola asarifolia*	indi	forb	PYAS	*Pyrola asarifolia*	alpine pyrola
PYPI2	*Pyrola picta*	indi	forb	PYDE	*Pyrola dentata*	toothleaf pyrola
PYPI2	*Pyrola picta*	indi	forb	PYPI	*Pyrola picta*	whitevein pyrola
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TITRU	*Tiarella trifoliata unifoliata*	coolwort foamflower
TRBOL	*Trientalis borealis ssp. latifolia*	indi	forb	TRLA2	*Trientalis latifolia*	western starflower
TROV2	*Trillium ovatum*	indi	forb	TROV	*Trillium ovatum*	white trillium
VAHE	*Vancouveria hexandra*	indi	forb	VAHE	*Vancouveria hexandra*	white inside-out-flower
VASI	*Valeriana sitchensis*	indi	forb	VASI	*Valeriana sitchensis*	sitka valerian
VIGL	*Viola glabella*	indi	forb	VIGL	*Viola glabella*	stream violet
VIOR	*Viola orbiculata*	indi	forb	VIOR2	*Viola orbiculata*	round-leaved violet
XETE	*Xerophyllum tenax*	indi	forb	XETE	*Xerophyllum tenax*	beargrass
CAIN9	*Carex inops*	indi	grami	CAPE5	*Carex pensylvanica*	long-stolon sedge
CYEC	*Cynosurus echinatus*	indi	grami	CYEC	*Cynosurus echinatus*	hedgehog dogtail
FEID	*Festuca idahoensis*	indi	grami	FEID	*Festuca idahoensis*	idaho fescue
FESTU	*Festuca sp.*	indi	grami	FESTU	*Festuca spp.*	fescue species
MESU	*Melica subulata*	indi	grami	MESU	*Melica subulata*	Alaska oniongrass
CYSC4	*Cytisus scoparius*	weed	shrub	CYSC	*Cytisus scoparius*	Scotch broom
GEMO2	*Genista monspessulana*	weed	shrub	CYMO3	*Cytisus monspessulanas*	French broom
SPJU2	*Spartium junceum*	weed	shrub	SPJU?	*Spartium junceum*	Spanish broom
ULEU	*Ulex europaeus*	weed	shrub	ULEU	*Ulex europaeus*	gorse
ACNO4	*Acaena novae-zelandica*	weed	forb	ACAN	*Acaena anserinifolia*	Biddy-biddy
ACRE3	*Acroptilon repens*	weed	forb	ACRE3	*Acroptilon repens*	Russian knapweed
CALA20	*Carthamus lanatus*	weed	forb	CALA?	*Carthamus lanatus*	woolly distaff thistle
CANU4	*Carduus nutans*	weed	forb	CANU4	*Carduus nutans*	musk thistle
CAPY2	*Carduus pycnocephalus*	weed	forb	CAPY3	*Carduus pycnocephalus*	italian thistle
CEBI2	*Centaurea bieberstinii*	weed	forb	CEMA	*Centaurea maculosa*	spotted knapweed
CEDET	*Centaurea debeauxii ssp. thuillieri*	weed	forb	CENIJ	*Centaurea jacea x nigra*	knapweed, meadow
CEDI3	*Centaurea diffusa*	weed	forb	CEDI	*Centaurea diffusa*	diffuse knapweed
CEME2	*Centaurea melitensis*	weed	forb	CEME	*Centaurea melitensis*	Malta starthistle
CESO3	*Centaurea solstitialis*	weed	forb	CESO	*Centaurea solstitialis*	yellow starthistle
CETR8	*Centaurea triumfetti*	weed	forb	CEVI?	*Centaurea virgata*	Squarrose knapweed
CHJU	*Chondrilla juncea*	weed	forb	CHJU	*Chondrilla juncea*	rush skeletonweed
CIAR4	*Cirsium arvense*	weed	forb	CIAR	*Cirsium arvense*	canada thistle
CIVU	*Cirsium vulgare*	weed	forb	CIVU	*Cirsium vulgare*	bull thistle
COAR4	*Convolvulus arvensis*	weed	forb	COAR2	*Convolvulus arvensis*	Field bindweed
CYOF	*Cynoglossum officinale*	weed	forb	CYOF	*Cynoglossum officinale*	hound's tongue
HYPE	*Hypericum perforatum*	weed	forb	HYPE	*Hypericum perforatum*	common st. john's wort
ISTI	*Isatis tinctoria*	weed	forb	ISTI	*Isatis tinctoria*	dyers woad
LIDA	*Linaria dalmatica*	weed	forb	LIDA	*Linaria dalmatica*	dalmation toadflax
LIVU2	*Linaria vulgaris*	weed	forb	LIVU2	*Linaria vulgaris*	yellow toadflax
LYSA2	*Lythrum salicaria*	weed	forb	LYSA	*Lythrum salicaria*	purple loosestrife
SEJA	*Senecio jacobaea*	weed	forb	SEJA	*Senecio jacobaea*	tansy ragwort

PLANTS	*PLANTS species*	Use	form	R6code	*R6 old species*	common_name
SIMA3	*Silybum marianum*	weed	forb	SIMA3	*Silybum marianum*	milk thistle
TRTE	*Tribulus terrestris*	weed	forb	TRTR	*Tribulus terrestris*	puncturevine
CORTA	*Cortaderia spp.*	weed	grami	CORTA	*Cortaderia spp.*	pampas grasses
CYESL	*Cyperus esculentus var. leptostachyus*	weed	grami	CYES	*Cyperus esculentus*	yellow nutsedge
ELRE4	*Elymus repens*	weed	grami	AGRE	*Agropyron repens*	quackgrass
POSA4	*Polygonum sachalinense*	weed	grami	POSA2	*Polygonum sachalinense*	giant knotweed
TACA8	*Taeniatherum caput-medusae*	weed	grami	TACA	*Taeniatherum caput-medusae*	medusa head

SUBSECTION A.3.4 CENTRAL OREGON

Deschutes, Fremont, Ochoco, and Winema National Forests, Crooked River National Grassland, Klamath (ORL04W) BLM Resource Area

ID Guide: Hopkins, William, and Robert Rawlings. 1988 (revised version). Major Indicator Shrubs and Herbs on National Forests of Eastern Oregon. USDA Forest Service, Pacific Northwest Region R6-TM-190-1985.

Johnson, Charles Grier Jr. 1993. Common Plants of the Inland Pacific Northwest, Malheur, Umatilla, Wallowa-Whitman National Forests. USDA Forest Service, Pacific Northwest Region R6-ERW-TP051-93.

PLANTS	***PLANTS species***	Use	form	**R6code**	**R6 old species**	**common_name**
ACMA3	*Acer macrophyllum*	indi	tree	ACMA3	*Acer macrophyllum*	bigleaf maple
ALRU2	*Alnus rubra*	indi	tree	ALRU	*Alnus rubra*	red alder
CHCH7	*Chrysolepis chysophylla*	indi	tree	CACH	*Castanopsis chysophylla*	golden chinquapin
CONU4	*Cornus nuttallii*	indi	tree	CONU	*Cornus nuttallii*	Pacific dogwood
POTR5	*Populus tremuloides*	indi	tree	POTR	*Populus tremuloides*	quaking aspen
QUGA4	*Quercus garryana*	indi	tree	QUGA	*Quercus garryana*	Oregon white oak
TABR2	*Taxus brevifolia*	indi	tree	TABR	*Taxus brevifolia*	western yew
ACCI	*Acer circinatum*	indi	shrub	ACCI	*Acer circinatum*	vine maple
ACGL	*Acer glabrum*	indi	shrub	ACGL	*Acer glabrum*	Rocky Mountain maple
ALIN2	*Alnus incana*	indi	shrub	ALIN	*Alnus incana*	mountain alder
ALVIS	*Alnus viridis ssp. sinuata*	indi	shrub	ALSI	*Alnus sinuata*	sitka alder
AMAL2	*Amelanchier alnifolia*	indi	shrub	AMAL	*Amelanchier alnifolia*	Saskatoon serviceberry
ARAR8	*Artemisia arbuscula*	indi	shrub	ARAR	*Artemisia arbuscula*	low sagebrush
ARNE	*Arctostaphylos nevadensis*	indi	shrub	ARNE	*Arctostaphylos nevadensis*	pinemat manzanita
ARPA6	*Arctostaphylos patula*	indi	shrub	ARPA	*Arctostaphylos patula*	greenleaf manzanita
ARRI2	*Artemisia rigida*	indi	shrub	ARRI	*Artemisia rigida*	stiff sagebrush
ARTR2	*Artemisia tridentata*	indi	shrub	ARTR	*Artemisia tridentata*	big sagebrush
ARTRV	*Artemisia tridentata ssp. vaseyana*	indi	shrub	ARTRV	*Artemisia tridentata vaseyana*	mountain big sagebrush
ARUV	*Arctostaphylos uva-ursi*	indi	shrub	ARUV	*Arctostaphylos uva-ursi*	bearberry, kinnikinnick
BENA	*Betula nana*	indi	shrub	BEGL	*Betula glandulosa*	bog birch
CELE3	*Cercocarpus ledifolius*	indi	shrub	CELE	*Cercocarpus ledifolius*	curlleaf mountain mahogany
CEMOG	*Cercocarpus montanus var. glaber*	indi	shrub	CEMO	*Cercocarpus montanus*	birchleaf mountain-mahogany
CEPR	*Ceanothus prostratus*	indi	shrub	CEPR	*Ceanothus prostratus*	prostrate ceanothus
CEVE	*Ceanothus velutinus*	indi	shrub	CEVE	*Ceanothus velutinus*	snowbrush ceanothus
CHRYS9	*Chrysothamnus SSP.*	indi	shrub	CHRYS9	*Chrysothamnus*	grey/green rabbitbrush
CHUM	*Chimaphila umbellata*	indi	shrub	CHUM	*Chimaphila umbellata*	Prince's pine
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
JUCO6	*Juniperus communis*	indi	shrub	JUCO4	*Juniperus communis*	common juniper
KAMI	*Kalmia microphylla*	indi	shrub	KAMI	*Kalmia microphylla*	alpine laurel
LOIN5	*Lonicera involucrata*	indi	shrub	LOIN	*Lonicera involucrata*	bearberry honeysuckle
LOUT2	*Lonicera utahensis*	indi	shrub	LOUT2	*Lonicera utahensis*	Utah honeysuckle
MAAQ2	*Mahonia aquifolium*	indi	shrub	BEAQ	*Berberis aquifolium*	tall Oregon grape
MANE2	*Mahonia nervosa*	indi	shrub	BENE	*Berberis nervosa*	Oregon grape
MARE11	*Mahonia repens*	indi	shrub	BERE	*Berberis repens*	creeping Oregon grape
MEFE	*Menziesia ferruginea*	indi	shrub	MEFE	*Menziesia ferruginea*	fool's huckleberry
PAMY	*Paxistima myrsinites*	indi	shrub	PAMY	*Pachistima myrsinites*	Oregon boxwood
PERA4	*Peraphyllum ramosissimum*	indi	shrub	PERA3	*Peraphyllum ramosissimum*	wild crab apple
PHEM	*Phyllodoce empetriformis*	indi	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
PHLE4	*Philadelphus lewisii*	indi	shrub	PHLE4	*Philadelphus lewisii*	Lewis' mock orange

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
PHMA5	*Physocarpus malvaceus*	indi	shrub	PHMA	*Physocarpus malvaceus*	ninebark
PRUNU	*Prunus spp*	indi	shrub	PRUNUS	*Prunus spp*	cherry or choke cherry
PUTR2	*Purshia tridentata*	indi	shrub	PUTR	*Purshia tridentata*	bitterbrush
RHAL2	*Rhododendron albiflorum*	indi	shrub	RHAL	*Rhododendron albiflorum*	cascades azalea
RHMA3	*Rhododendron macrophyllum*	indi	shrub	RHMA	*Rhododendron macrophyllum*	Pacific rhododendron
RICE	*Ribes cereum*	indi	shrub	RICE	*Ribes cereum*	wax current
RILA	*Ribes lacustre*	indi	shrub	RILA	*Ribes lacustre*	prickly currant
RIVI3	*Ribes viscossissimum*	indi	shrub	RIVI	*Ribes viscossissimum*	sticky currant
RUPA	*Rubus parviflorus*	indi	shrub	RUPA	*Rubus parviflorus*	thimbleberry
RUUR	*Rubus ursinus*	indi	shrub	RUUR	*Rubus ursinus*	Pacific blackberry
SASC	*Salix scouleriana*	indi	shrub	SASC	*Salix scouleriana*	Scouler's willow
SPBE2	*Spiraea betulifolia*	indi	shrub	SPBE	*Spiraea betulifolia*	birchleaf spirea
SPDO	*Spiraea douglasii*	indi	shrub	SPDO	*Spiraea douglasii*	Douglas spiraea
SYAL	*Symphoricarpos albus*	indi	shrub	SYAL	*Symphoricarpos albus*	common snowberry
SYHE	*Symphoricarpos hesperius*	indi	shrub	SYMO	*Symphoricarpos mollis*	creeping snowberry
SYOR2	*Symphoricarpos oreophilus*	indi	shrub	SYOR	*Symphoricarpos oreophilus*	mountain snowberry
VADE	*Vaccinium deliciosum*	indi	shrub	VADE	*Vaccinium deliciosum*	delicious blueberry
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VASC	*Vaccinium scoparium*	indi	shrub	VASC	*Vaccinium scoparium*	grouse huckleberry
VAUL	*Vaccinium uliginosum*	indi	shrub	VAOC2	*Vaccinium occidentale*	bog blueberry
ACTR	*Achlys triphylla*	indi	forb	ACTR	*Achlys triphylla*	vanilla leaf
ADBI	*Adenocaulon bicolor*	indi	forb	ADBI	*Adenocaulon bicolor*	trail plant
APAN2	*Apocynum androsaemifolium*	indi	forb	APAN	*Apocynum androsaemifolium*	spreading dogbane
ARCO9	*Arnica cordifolia*	indi	forb	ARCO	*Arnica cordifolia*	heart-leaf arnica
ARKI	*Arenaria kingii*	indi	forb	ARKI	*Arenaria kingii*	king's sandwort
ARLA8	*Arnica latifolia*	indi	forb	ARLA	*Arnica latifolia*	broadleaf arnica
ASCA2	*Asarum caudatum*	indi	forb	ASCA3	*Asarum caudatum*	wild ginger
ATFI	*Athyrium filix-femina*	indi	forb	ATFI	*Athyrium filix-femina*	common ladyfern
BASA3	*Balsamorhiza sagittata*	indi	forb	BASA	*Balsamorhiza sagittata*	arrowleaf balsamroot
CAQU2	*Camassia quamash*	indi	forb	CAQU2	*Camassia quamash*	small camas
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly
COCA13	*Cornus canadensis*	indi	forb	COCA	*Cornus canadensis*	bunchberry
DITR2	*Disporum trachycarpum*	indi	forb	DITR	*Disporum tracycarpum*	fairy bells
FRVI	*Fragaria virginiana*	indi	forb	FRVI	*Fragaria virginiana*	strawberry
GETR	*Geum triflorum*	indi	forb	GETR	*Geum triflorum*	red avens, old man's whiskers
GOOB2	*Goodyera oblongifolia*	indi	forb	GOOB	*Goodyera oblongifolia*	western rattlesnake-plantain
GYDR	*Gymnocarpium dryopteris*	indi	forb	GYDR	*Gymnocarpium dryopteris*	oak fern
LIBO3	*Linnaea borealis*	indi	forb	LIBO2	*Linnaea borealis*	twinflower
LOMAT	*Lomatium*	indi	forb	LOMAT	*Lomatium*	desertparsley
LUAR3	*Lupinus argenteus*	indi	forb	LUAR3	*Lupinus argenteus*	silvery lupine
LUCA	*Lupinus caudatus*	indi	forb	LUCA	*Lupinus caudatus*	tailcup lupine
LULE2	*Lupinus lepidus*	indi	forb	LULE2	*Lupinus lepidus*	Pacific lupine
LUPE	*Luetkea pectinata*	indi	forb	LUPE	*Luetkea pectinata*	partridgefoot
LUPO2	*Lupinus polyphyllus*	indi	forb	LUPO2	*Lupinus polyphyllus*	bigleaf lupine
LYAM3	*Lysichiton americanus*	indi	forb	LYAM	*Lysichiton americanum*	skunk cabbage
MARA7	*Maianthemum racemosum*	indi	forb	SMRA	*Smilacina racemosa*	False Solomn'S Seal

PLANTS	*PLANTS species*	Use	form	R6code	R6 old species	common_name
MAST4	*Maianthemum stellatum*	indi	forb	SMST	*Smilacina stellata*	starry Solomon's seal
PENST	*Penstemon*	indi	forb	PENST	*Penstemon*	beardtongue
PHLOX	*Phlox*	indi	forb	PHLOX	*Phlox spp.*	phlox
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
POPU3	*Polemonium pulcherrimum*	indi	forb	POPU	*Polemonium pulcherrimum*	Jacob's ladder
PRHO2	*Prosartes hookeri*	indi	forb	DIHO	*Disporum hookeri*	hooker fairybells
PSJA2	*Pseudostellaria jamesiana*	indi	forb	STJA	*Stellaria jamesiana*	tuber starwort
PTAQ	*Pteridium aquilinum*	indi	forb	PTAQ	*Pteridium aquilinum*	bracken fern
SETR	*Senecio triangularis*	indi	forb	SETR	*Senecio triangularis*	arrowleaf groundsel
STAM2	*Streptopus amplexifolius*	indi	forb	STAM	*Streptopus amplexifolius*	twisted stalk
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TITRU	*Tiarella trifoliata unifoliata*	coolwort foamflower
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TIUN	*Tiarella unifoliata*	coolwort foamflower
TRBOL	*Trientalis borealis ssp. latifolia*	indi	forb	TRLA2	*Trientalis latifolia*	western starflower
TRCA	*Trautvetteria caroliniensis*	indi	forb	TRCA3	*Trautvetteria caroliniensis*	false bugbane
VIGL	*Viola glabella*	indi	forb	VIGL	*Viola glabella*	stream violet
WYMO	*Wyethia mollis*	indi	forb	WYMO	*Whyethia mollis*	woolly wyethia
XETE	*Xerophyllum tenax*	indi	forb	XETE	*Xerophyllum tenax*	beargrass
ACOC3	*Achnatherum occidentale*	indi	grami	STOC	*Stipa occidentalis*	western needlegrass
BRCA5	*Bromus carinatus*	indi	grami	BRCA	*Bromus carinatus*	California brome
BRTE	*Bromus tectorum*	indi	grami	BRTE	*Bromus tectorum*	cheatgrass
BRVU	*Bromus vulgaris*	indi	grami	BRVU	*Bromus vulgaris*	columbia brome
CAAN15	*Carex angustata*	indi	grami	CAEU	*Carex eurycarpa*	widefruit sedge
CAGE2	*Carex geyeri*	indi	grami	CAGE	*Carex geyeri*	elk sedge
CAIN9	*Carex inops*	indi	grami	CAPE5	*Carex pensylvanica*	long-stolon sedge
CARO5	*Carex rossii*	indi	grami	CARO	*Carex rossii*	ross' sedge
CARU	*Calamagrostis rubescens*	indi	grami	CARU	*Calamagrostis rubescens*	pinegrass
ELEL5	*Elymus elymoides*	indi	grami	SIHY	*Sitanion hystrix*	squirreltail
ELGL	*Elymus glaucus*	indi	grami	ELGL	*Elymus glaucus*	blue wildrye
ELQU2	*Eleocharis quinqueflora*	indi	grami	ELPA2	*Eleocharis pauciflora*	few-flowered spikerush
FEID	*Festuca idahoensis*	indi	grami	FEID	*Festuca idahoensis*	idaho fescue
FEOC	*Festuca occidentalis*	indi	grami	FEOC	*Festuca occidentalis*	western fescue
PONE2	*Poa nervosa*	indi	grami	PONE	*Poa nervosa*	Wheeler's bluegrass
POSE	*Poa secunda*	indi	grami	POSA	*Poa sandbergii*	Sandberg's bluegrass
PSSP6	*Pseudoroegneria spicata*	indi	grami	AGSP	*Agropyron spicatum*	bluebunch wheatgrass
ROSA5	*Rosa spp.*	nfor	shrub	ROSA	*Rosa spp.*	Rose
ASTRA	*Astragalus*	nfor	forb	ASTRA	*Astragalus spp.*	milkvetch
ERBL	*Erigeron bloomeri*	nfor	forb	ERBL	*Erigeron bloomeri*	dwarf yellow fleabane
ERCH4	*Erigeron chrysopsidis*	nfor	forb	ERCH	*Erigeron chrysopsidis*	dwarf yellow fleabane
ERFL4	*Eriogonum flavum*	nfor	forb	ERFL	*Eriogonum flavum*	golden buckwheat
ERHE2	*Eriogonum heracleoides*	nfor	forb	ERHE	*Eriogonum heracleoides*	creamy or Wyeth's buckwheat
ERIGE2	*Erigeron*	nfor	forb	ERIGE2	*Erigeron*	fleabane
ERIOG	*Eriogonum*	nfor	forb	ERIOG	*Eriogonum*	buckwheat
POPH	*Polygonum phytolaccaefolium*	nfor	forb	POPH	*Polygonum phytolaccaefolium*	pokeweed fleeceflower
TRMA3	*Trifolium macrocephalum*	nfor	forb	TRMA	*Trifolium macrocephalum*	bighead clover
CACA4	*Calamagrostis canadensis*	nfor	grami	CACA	*Calamagrostis canadensis*	bluejoint reedgrass
DAUN	*Danthonia unispicata*	nfor	grami	DAUN	*Danthonia unispicata*	One-Spike Oatgrass

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
DECA18	*Deschampsia caespitosa*	nfor	grami	DECE	*Deschampsia cespitosa*	tufted hairgrass
FEVI	*Festuca viridula*	nfor	grami	FEVI	*Festuca viridula*	green fescue
LECI4	*Leymus cinereus*	nfor	grami	ELCI2	*Elymus cinereus*	giant wildrye
POPR	*Poa pratensis*	nfor	grami	POPR	*Poa pratensis*	Kentucky bluegrass
POSE	*Poa secunda*	nfor	grami	POSA	*Poa sandbergii*	Sandberg's bluegrass
ARLUE	*Artemisia ludoviciana ssp. estesii*	sens	shrub	ARLUE	*Artemisia ludoviciana ssp. estesii*	Estes' wormwood
AGEL	*Agoseris elata*	sens	forb	AGEL	*Agoseris elata*	Tall agoseris
ALBO	*Allium bolanderi*	sens	forb	ALBO	*Allium bolanderi*	Bolander's onion
ALBR	*Allium brandegeei*	sens	forb	ALBR	*Allium brandegei*	brandegee onion
ALMA6	*Allium madidum*	sens	forb	ALMA2	*Allium madidum*	swamp onion
ARSUH	*Arabis suffrutescens var. horizontalis*	sens	forb	ARSUH	*Arabis suffrutescens var. horizontalis*	Crater Lake rockcress
ARVI6	*Arnica viscosa*	sens	forb	ARVI2	*Arnica viscose*	Shasta arnica
ASCAV	*Asarum caudatum var. viridiflorum*	sens	forb	ASWA2	*Asarum wagnerii*	green-flowered ginger
ASDI2	*Astragalus diaphanus*	sens	forb	ASDID2	*Astragalus diaphanous var. diurnus*	transparent milkvetch
ASDI2	*Astragalus diaphanus*	sens	forb	ASDID	*Astragalus diaphanus var. diaphanus*	transparent milkvetch
ASHO3	*Astragalus howellii*	sens	forb	ASHOH	*Astragalus howellii var. howellii*	Howell's milkvetch
ASPE4	*Astragalus peckii*	sens	forb	ASPE2	*Astragalus peckii*	Peck's milkvetch
ASTE4	*Astragalus tegetarioides*	sens	forb	ASTE	*Astragalus tegetarioides*	Deschutes milkvetch
BOPU2	*Botrychium pumicola*	sens	forb	BOPU	*Botrychium pumicola*	pumice grape-fern
CACH15	*Castilleja chlorotica*	sens	forb	CACH4	*Castilleja chlorotica*	green-tinged paintbrush
CALOL	*Calochortus longebarbatus var. longebarbatus*	sens	forb	CALOL	*Calochortus longebarbatus var. longebarbatus*	long-bearded mariposa lily
CALOP4	*Calochortus longebarbatus var. peckii*	sens	forb	CALOP	*Calochortus longebarbatus var. peckii*	long-bearded mariposa lily
CASC6	*Campanula scabrella*	sens	forb	CASC	*Campanula scabrella*	rough harebell
CIBU	*Cicuta bulbifera*	sens	forb	CIBU	*Cicuta bulbifera*	bulb-bearing waterhemlock
COMA	*Collomia mazama*	sens	forb	COMA4	*Collomia mazama*	Mt. Mazama collomia
COMA3	*Collomia macrocalyx*	sens	forb	COMA	*Collomia macrocalyx*	bristle-flower collomia
CYCA4	*Cypripedium californicum*	sens	forb	CYCA	*Cypripedium californicum*	California lady's slipper
CYNI3	*Cymopterus nivalis*	sens	forb	CYNI	*Cymopterus nivalis*	Hayden's cymopterus
CYPA19	*Cypripedium parviflorum*	sens	forb	CYCAP	*Cypripedium calceolus var. parviflorum*	yellow lady's slipper
DRAU2	*Draba aureola*	sens	forb	DRAU	*Draba aureola*	alpine draba
ERDI10	*Eriogonum diclinum*	sens	forb	ERDI3	*Eriogonum diclinum*	Jayne's Canyon buckwheat
ERPR9	*Eriogonum prociduum*	sens	forb	ERPR3	*Eriogonum prociduum*	prostrate buckwheat
EUGO5	*Eucephalus gormanii*	sens	forb	ASGO	*Aster gormanii*	Gorman's aster
GASEW	*Galium serpenticum ssp. Warnerense*	sens	forb	GASEW	*Galium serpenticum ssp. Warnerense*	Warner Mtn. bedstraw
GENE	*Gentiana newberryi*	sens	forb	GENE	*Gentiana newberryi*	Newberry's gentian
HAWHD 2	*Hazardia whitneyi var. discoideus*	sens	forb	HAWHD	*Haplopappus whitneyi ssp. discoideus*	Whitney's haplopappus
HIBO	*Hieracium bolanderi*	sens	forb	HIBO	*Hieracium bolanderi*	Bolander's hawkweed
IVSH	*Ivesia shockleyi*	sens	forb	IVSH	*Ivesia shockleyi*	Shockley's ivesia
LODO	*Lobelia dortmanna*	sens	forb	LODO3	*Lobelia dortmanna*	Water lobelia
LUCU	*Lupinus cusickii*	sens	forb	LUCU	*Lupinus cusickii*	Cusick's lupine
LYAN2	*Lycopodium annotinum*	sens	forb	LYAN	*Lycopodium annotinum*	Stiff club-moss

PLANTS	***PLANTS species***	Use	form	**R6code**	**R6 old species**	**common_name**
MIJE	*Mimulus jepsonii*	sens	forb	MIJE	*Mimulus jepsonii*	Jepson's monkey-flower
MITR3	*Mimulus tricolor*	sens	forb	MITR3	*Mimulus tricolor*	tricolored monkey-flower
OPPU3	*Ophioglossum pusillum*	sens	forb	OPVU	*Ophioglossum vulgatum*	adder's-tongue
OXOC	*Oxypolis occidentalis*	sens	forb	OXOC	*Oxypolis occidentalis*	western oxypolis
PEER3	*Perideridia erythrorhiza*	sens	forb	PEER2	*Perideridia erythrorhiza*	red-root yampah
PEGL10	*Penstemon glaucinus*	sens	forb	PEGL6	*Penstemon glaucinus*	blue-leaved penstemon
PEHO5	*Perideridia howellii*	sens	forb	PEHO	*Perideridia howellii*	Howell's yampah
PEPE10	*Penstemon peckii*	sens	forb	PEPE2	*Penstemon peckii*	Peck's penstemon
ROCO3	*Rorippa columbiae*	sens	forb	ROCO	*Rorippa columbiae*	Columbia cress
SINUI2	*Silene nuda ssp. insectivora*	sens	forb	SINUI	*Silene nuda ssp. insectivora*	fringed campion
SISCS	*Silene scaposa var. scaposa*	sens	forb	SISCS	*Silene scaposa var. scaposa*	scapose catchfly
STPS	*Stylocline psilocarphoides*	sens	forb	STPS	*Stylocline psilocarphoides*	Peck's stylocline
THBR	*Thelypodium brachycarpum*	sens	forb	THBR	*Thelypodium brachycarpum*	Short-fruited thelypodium
THHOH	*Thelypodium howellii ssp. howellii*	sens	forb	THHOH	*Thelypodium howellii ssp. howellii*	Howell's thelypodium
ACHE10	*Achnatherum hendersonii*	sens	grami	ORHE	*Oryzopsis hendersonii*	Henderson's ricegrass
CABR	*Calamagrostis breweri*	sens	grami	CABR7	*Calamagrostis breweri*	brewer's reedgrass
CAMI7	*Carex microptera*	sens	grami	CALI3	*Carex limnophila*	pond sedge
MEST	*Melica stricta*	sens	grami	MEST	*Melica stricta*	nodding melica
PLOR3	*Pleuropogon oregonus*	sens	grami	PLOR	*Pleuropogon oregonus*	Oregon semaphoregrass
CYSC4	*Cytisus scoparius*	weed	shrub	CYSC	*Cytisus scoparius*	broom, Scotch
RUAR9	*Rubus armeniacus*	weed	shrub	RUDI	*Rubus discolor*	Himalayan blackberry
ACRE3	*Acroptilon repens*	weed	forb	CERE	*Centaurea repens*	Russian Knapweed
ACRE3	*Acroptilon repens*	weed	forb	ACRE3	*Acroptilon repens*	Russian knapweed
ARMI2	*Arctium minus*	weed	forb	ARMI2	*Arctium minus*	lessor burdock
KOSC	*Kochia scoparia*	weed	forb	BASC5	*Bassia scoparia*	kochia
CADR	*Cardaria draba*	weed	forb	CADR2	*Cardaria draba*	white top (hoary cress)
CANU4	*Carduus nutans*	weed	forb	CANU4	*Carduus nutans*	musk thistle
CEBI2	*Centaurea bieberstinii*	weed	forb	CEMA	*Centaurea maculosa*	spotted knapweed
CEDI3	*Centaurea diffusa*	weed	forb	CEDI	*Centaurea diffusa*	diffuse knapweed
CESO3	*Centaurea solstitialis*	weed	forb	CESO	*Centaurea solstitialis*	yellow starthistle
CHJU	*Chondrilla juncea*	weed	forb	CHJU	*Chondrilla juncea*	rush skeletonweed
CIAR4	*Cirsium arvense*	weed	forb	CIAR	*Cirsium arvense*	canada thistle
CIVU	*Cirsium vulgare*	weed	forb	CIVU	*Cirsium vulgare*	bull thistle
COAR4	*Convolvulus arvensis*	weed	forb	COAR2	*Convolvulus arvensis*	field bindweed
CYOF	*Cynoglossum officinale*	weed	forb	CYOF	*Cynoglossum officinale*	hound's tongue
DIFU2	*Dipsacus fullonum*	weed	forb	DISY	*Dipsacus sylvestris*	teasel
EUES	*Euphorbia esula*	weed	forb	EUES	*Euphorbia esula*	leafy spurge
HYPE	*Hypericum perforatum*	weed	forb	HYPE	*Hypericum perforatum*	common St. John's wort
ISTI	*Isatis tinctoria*	weed	forb	ISTI	*Isatis tinctoria*	dyers woad
LIDA	*Linaria dalmatica*	weed	forb	LIDA	*Linaria dalmatica*	dalmation toadflax
LIVU2	*Linaria vulgaris*	weed	forb	LIVU2	*Linaria vulgaris*	yellow toadflax
LYSA2	*Lythrum salicaria*	weed	forb	LYSA	*Lythrum salicaria*	purple loosestrife
MADIA	*Madia*	weed	forb	MADIA	*Madia spp.*	tarweed
ONAC	*Onopordum acanthium*	weed	forb	ONAC	*Onopordum acanthium*	scotch thistle
PORE5	*Potentilla recta*	weed	forb	PORE	*Potentilla recta*	cinquefoil, sulfur
SAAE	*Salvia aethiopis*	weed	forb	SAAE2	*Salvia aethiopis*	mediterranean sage
SAKA	*Salsola kali*	weed	forb	SAKA	*Salsola kali*	russian thistle
SEJA	*Senecio jacobaea*	weed	forb	SEJA	*Senecio jacobaea*	tansy ragwort
SIMA3	*Silybum marianum*	weed	forb	SIMA3	*Silybum marianum*	milk thistle

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
SOAR2	*Sonchus arvensis*	weed	forb	SOAR	*Sonchus arvensis*	perennial sowthistle
TAPA6	*Tanecetum parthenium*	weed	forb	TAPA6	*Tanecetum parthenium*	feverfew
TRTE	*Tribulus terrestris*	weed	forb	TRTR	*Tribulus terrestris*	puncturevine
VETH	*Verbascum thapsus*	weed	forb	VETH	*Verbascum thapsus*	mullein, common
ELRE4	*Elymus repens*	weed	grami	AGRE	*Agropyron repens*	quackgrass
PHAR3	*Phalaris arundinacea*	weed	grami	PHAR	*Phalaris arundinacea*	reed canary grass
PHAR3	*Phalaris arundinacea*	weed	grami	PHARP	*Phalaris arundinacea var. picta*	ribbongrass
TACA8	*Taeniatherum caput-medusae*	weed	grami	TACA	*Taeniatherum caput-medusae*	medusa head
VEDU	*Ventenata dubia*	weed	grami	VEDU	*Ventenata dubia*	ventenata

SUBSECTION A.3.5 NE OREGON

Malheur, Umatilla, and Wallowa-Whitman National Forests.

ID Guide: Johnson, Charles Grier Jr. 1993. Common Plants of the Inland Pacific Northwest, Malheur, Umatilla, Wallowa-Whitman National Forests. USDA Forest Service, Pacific Northwest Region R6-ERW-TP051-93.

PLANTS	*PLANTS species*	Use	form	R6code	R6 old species	common_name
TABR2	*Taxus brevifolia*	indi	tree	TABR	*Taxus brevifolia*	western yew
ACGLD4	*Acer glabrum var. Douglasii*	indi	shrub	ACGLD	*Acer glabrum var. Douglasii*	Douglas maple
ALVIS	*Alnus viridis ssp. sinuata*	indi	shrub	ALSI	*Alnus sinuata*	sitka alder
ARAR8	*Artemisia arbuscula*	indi	shrub	ARAR	*Artemisia arbuscula*	low sagebrush
ARCTO3	*Arctostaphylos spp.*	indi	shrub	ARCTO	*Arctostaphylos spp.*	Arctostaphylos spp.
ARRI2	*Artemisia rigida*	indi	shrub	ARRI	*Artemisia rigida*	stiff sagebrush
ARTRV	*Artemisia tridentata ssp. vaseyana*	indi	shrub	ARTRV	*Artemisia tridentata vaseyana*	mountain big sagebrush
CELE3	*Cercocarpus ledifolius*	indi	shrub	CELE	*Cercocarpus ledifolius*	curlleaf mountain mahogany
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
MEFE	*Menziesia ferruginea*	indi	shrub	MEFE	*Menziesia ferruginea*	fool's huckleberry
PERA4	*Peraphyllum ramosissimum*	indi	shrub	PERA3	*Peraphyllum ramosissimum*	wild crab apple
PHEM	*Phyllodoce empetriformis*	indi	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
PHMA5	*Physocarpus malvaceus*	indi	shrub	PHMA	*Physocarpus malvaceus*	ninebark
PUTR2	*Purshia tridentata*	indi	shrub	PUTR	*Purshia tridentata*	bitterbrush
RHAL2	*Rhododendron albiflorum*	indi	shrub	RHAL	*Rhododendron albiflorum*	cascades azalea
RHGL	*Rhus glabra*	indi	shrub	RHGL	*Rhus glabra*	smooth sumac
SPBE2	*Spiraea betulifolia*	indi	shrub	SPBE	*Spiraea betulifolia*	birchleaf spirea
SYAL	*Symphoricarpos albus*	indi	shrub	SYAL	*Symphoricarpos albus*	common snowberry
SYOR2	*Symphoricarpos oreophilus*	indi	shrub	SYOR	*Symphoricarpos oreophilus*	mountain snowberry
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VASC	*Vaccinium scoparium*	indi	shrub	VASC	*Vaccinium scoparium*	grouse huckleberry
ADBI	*Adenocaulon bicolor*	indi	forb	ADBI	*Adenocaulon bicolor*	trail plant
ARCO9	*Arnica cordifolia*	indi	forb	ARCO	*Arnica cordifolia*	heart-leaf arnica
ASCA2	*Asarum caudatum*	indi	forb	ASCA3	*Asarum caudatum*	wild ginger
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly
COCA13	*Cornus canadensis*	indi	forb	COCA	*Cornus canadensis*	bunchberry
COOC	*Coptis occidentalis*	indi	forb	COOC2	*Coptis occidentalis*	goldthread
DITR2	*Disporum trachycarpum*	indi	forb	DITR	*Disporum tracycarpum*	fairy bells
GYDR	*Gymnocarpium dryopteris*	indi	forb	GYDR	*Gymnocarpium dryopteris*	oak fern
LIBO3	*Linnaea borealis*	indi	forb	LIBO2	*Linnaea borealis*	twinflower
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
POPH	*Polygonum phytolaccaefolium*	indi	forb	POPH	*Polygonum phytolaccaefolium*	pokeweed fleeceflower
POPU3	*Polemonium pulcherrimum*	indi	forb	POPU	*Polemonium pulcherrimum*	Jacob's ladder
PTAQ	*Pteridium aquilinum*	indi	forb	PTAQ	*Pteridium aquilinum*	bracken fern
SETR	*Senecio triangularis*	indi	forb	SETR	*Senecio triangularis*	arrowleaf groundsel
STAM2	*Streptopus amplexifolius*	indi	forb	STAM	*Streptopus amplexifolius*	twisted stalk
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TITRU	*Tiarella trifoliata unifoliata*	coolwort foamflower
TRCA	*Trautvetteria caroliniensis*	indi	forb	TRCA3	*Trautvetteria caroliniensis*	false bugbane
VASI	*Valeriana sitchensis*	indi	forb	VASI	*Valeriana sitchensis*	Sitka valerian

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
ACOC3	*Achnatherum occidentale*	indi	grami	STOC	*Stipa occidentalis*	Western Needlegrass
BRVU	*Bromus vulgaris*	indi	grami	BRVU	*Bromus vulgaris*	columbia brome
CAGE2	*Carex geyeri*	indi	grami	CAGE	*Carex geyeri*	elk sedge
CARO5	*Carex rossii*	indi	grami	CARO	*Carex rossii*	ross' sedge
CARU	*Calamagrostis rubescens*	indi	grami	CARU	*Calamagrostis rubescens*	pinegrass
FEID	*Festuca idahoensis*	indi	grami	FEID	*Festuca idahoensis*	Idaho fescue
JUDR	*Juncus drummondii*	indi	grami	JUDR	*Juncus drummondii*	drummond rush
POSE	*Poa secunda*	indi	grami	POSA	*Poa sandbergii*	Sandberg's bluegrass
POWH2	*Poa wheeleri*	indi	grami	PONEW	*Poa nervosa wheeleri*	Wheeler's bluegrass
PSSPS	*Pseudoroegneria spicata ssp. spicata*	indi	grami	AGSP	*Agropyron spicatum*	bluebunch wheatgrass
ALVIS	*Alnus viridis ssp. sinuata*	nfor	shrub	ALSI	*Alnus sinuata*	sitka alder
AMAL2	*Amelanchier alnifolia*	nfor	shrub	AMAL	*Amelanchier alnifolia*	Saskatoon serviceberry
ARAR8	*Artemisia arbuscula*	nfor	shrub	ARAR	*Artemisia arbuscula*	low sagebrush
ARRI2	*Artemisia rigida*	nfor	shrub	ARRI	*Artemisia rigida*	stiff sagebrush
ARTRV	*Artemisia tridentata ssp. vaseyana*	nfor	shrub	ARTRV	*Artemisia tridentata vaseyana*	mountain big sagebrush
CELAR	*Celtis laevigata var. reticulata*	nfor	shrub	CERE2	*Celtis reticulata*	netleaf hackberry
CELE3	*Cercocarpus ledifolius*	nfor	shrub	CELE	*Cercocarpus ledifolius*	curlleaf mountain mahogany
CEVE	*Ceanothus velutinus*	nfor	shrub	CEVE	*Ceanothus velutinus*	snowbrush ceanothus
GLSPA	*Glossopetalon spinescens var. aridium*	nfor	shrub	GLNE	*Glossopetalon nevadense*	Snake River green-bush
HODI	*Holodiscus discolor*	nfor	shrub	HODI	*Holodiscus discolor*	oceanspray
PERA4	*Peraphyllum ramosissimum*	nfor	shrub	PERA3	*Peraphyllum ramosissimum*	wild crab apple
PHLE4	*Philadelphus lewisii*	nfor	shrub	PHLE4	*Philadelphus lewisii*	Lewis' mock orange
PHMA5	*Physocarpus malvaceus*	nfor	shrub	PHMA	*Physocarpus malvaceus*	ninebark
PRUNU	*Prunus spp*	nfor	shrub	PRUNUS	*Prunus spp*	cherry or choke cherry
PUTR2	*Purshia tridentata*	nfor	shrub	PUTR	*Purshia tridentata*	bitterbrush
RHGL	*Rhus glabra*	nfor	shrub	RHGL	*Rhus glabra*	smooth sumac
ROSA5	*Rosa spp.*	nfor	shrub	ROSA	*Rosa spp.*	rose
SYAL	*Symphoricarpos albus*	nfor	shrub	SYAL	*Symphoricarpos albus*	common snowberry
SYOR2	*Symphoricarpos oreophilus*	nfor	shrub	SYOR	*Symphoricarpos oreophilus*	mountain snowberry
ASCU5	*Astragalus cusickii*	nfor	forb	ASCU4	*Astragalus cusickii*	Cusick's milkvetch
ASIN5	*Astragalus inflexus*	nfor	forb	ASIN2	*Astragalus inflexus*	hairy milkvetch
BAIN	*Balsamorhiza incana*	nfor	forb	BAIN	*Balsamorhiza incana*	hoary balsmroot
BASA3	*Balsamorhiza sagittata*	nfor	forb	BASA	*Balsamorhiza sagittata*	arrowleaf balsamroot
CACU2	*Camassia cusickii*	nfor	forb	CACU	*Camassia cusickii*	Cusick's camas
DAOR2	*Dalea ornata*	nfor	forb	PEOR4	*Petalostemon ornatus*	western prairie-clover
ERCH4	*Erigeron chrysopsidis*	nfor	forb	ERCH	*Erigeron chrysopsidis*	dwarf yellow fleabane
ERDO	*Eriogonum douglasii*	nfor	forb	ERDO	*Eriogonum douglasii*	Douglas' buckwheat
ERFL4	*Eriogonum flavum*	nfor	forb	ERFL	*Eriogonum flavum*	golden buckwheat
ERHE2	*Eriogonum heracleoides*	nfor	forb	ERHE	*Eriogonum heracleoides*	creamy or wyeth's buckwheat
ERMI4	*Eriogonum microthecum*	nfor	forb	ERMI	*Eriogonum microthecum*	slender buckwheat
ERPU2	*Erigeron pumilus*	nfor	forb	ERPU	*Erigeron pumilus*	shaggy fleabane
ERST4	*Eriogonum strictum*	nfor	forb	ERST2	*Eriogonum strictum*	strict buckwheat
ERUMM	*Eriogonum umbellatum var. majus*	nfor	forb	ERUMS	*Eriogonum umbellatum subalpinum*	sulfur buckwheat
FRAL2	*Frasera albicaulis*	nfor	forb	FRAL2	*Frasera albicaulis*	white stemmed frasera

PLANTS	*PLANTS species*	Use	form	R6code	R6 old species	common_name
GETR	*Geum triflorum*	nfor	forb	GETR	*Geum triflorum*	red avens, old man's whiskers
HICY	*Hieracium cynoglossoides*	nfor	forb	HIAL2	*Hieracium albertinum*	western hawkweed
LECOW	*Lewisia columbiana var. wallowaensis*	nfor	forb	LECOW	*Lewisia columbiana wallowaensis*	wallowa lewisia
LOCO4	*Lomatium cous*	nfor	forb	LOCO2	*Lomatium cous*	cous biscuit-root
LOMA3	*Lomatium macrocarpum*	nfor	forb	LOMA	*Lomatium macrocarpum*	large fruited lomatium
LUARL5	*Lupinus argenteus ssp. argenteus var. laxiflorus*	nfor	forb	LULA2	*Lupinus laxiflorus*	spurred lupine
LUCA	*Lupinus caudatus*	nfor	forb	LUCA	*Lupinus caudatus*	tailcup lupine
LUSE4	*Lupinus sericeus*	nfor	forb	LUSE	*Lupinus sericeus*	silky lupine
OECA10	*Oenothera caespitosa*	nfor	forb	OECA2	*Oenothera caespitosa*	desert evening primrose
OPPO	*Opuntia polyacantha*	nfor	forb	OPPO	*Opuntia polyacantha*	plains prickly pear
PEEL4	*Penstemon elegantulus*	nfor	forb	PEEL	*Penstemon elegantulus*	lovely penstemon
PEGL5	*Penstemon globosus*	nfor	forb	PEGL4	*Penstemon globosus*	globe penstemon
PETR6	*Penstemon triphyllus*	nfor	forb	PETR	*Penstemon triphyllus*	whorled penstemon
PHCO10	*Phlox colubrina*	nfor	forb	PHCO2	*Phlox colubrina*	Snake River phlox
PHOR2	*Physaria oregana*	nfor	forb	PHOR	*Physaria oregana*	Oregon twinpod
POPH	*Polygonum phytolaccaefolium*	nfor	forb	POPH	*Polygonum phytolaccaefolium*	pokeweed fleeceflower
SCAN3	*Scutellaria angustifolia*	nfor	forb	SCAN	*Scutellaria angustifolia*	narrowleaf skullcap
SELA	*Sedum lanceolatum*	nfor	forb	SELA2	*Sedum lanceolatum*	lanceleaved stonecrop
TRMA3	*Trifolium macrocephalum*	nfor	forb	TRMA	*Trifolium macrocephalum*	bighead clover
ACOC3	*Achnatherum occidentale*	nfor	grami	STOC	*Stipa occidentalis*	western needlegrass
ARPUL	*Aristida purpurea longiseta*	nfor	grami	ARLO3	*Aristida longiseta*	fendler (red) threeawn
BRCA5	*Bromus carinatus*	nfor	grami	BRCA	*Bromus carinatus*	California brome
CAGE2	*Carex geyeri*	nfor	grami	CAGE	*Carex geyeri*	elk sedge
CAHO5	*Carex hoodii*	nfor	grami	CAHO	*Carex hoodii*	Hood's sedge
CAPE7	*Carex petasata*	nfor	grami	CAPE	*Carex petasata*	Liddon's sedge
DAIN	*Danthonia intermedia*	nfor	grami	DAIN	*Danthonia intermedia*	timber oatgrass
DAUN	*Danthonia unispicata*	nfor	grami	DAUN	*Danthonia unispicata*	one-spike oatgrass
ELELE	*Elymus elymoides ssp. elymoides*	nfor	grami	SIHY	*Sitanian hystrix*	bottlebrush squirreltail
FEID	*Festuca idahoensis*	nfor	grami	FEID	*Festuca idahoensis*	Idaho fescue
FEVI	*Festuca viridula*	nfor	grami	FEVI	*Festuca viridula*	green fescue
JUPA	*Juncus parryi*	nfor	grami	JUPA	*Juncus parryi*	Parry's rush
KOMA	*Koeleria macrantha*	nfor	grami	KOCR	*Koeleria cristata*	prairie junegrass
LECI4	*Leymus cinereus*	nfor	grami	ELCI2	*Elymus cinereus*	giant wildrye
POPR	*Poa pratensis*	nfor	grami	POPR	*Poa pratensis*	Kentucky bluegrass
POSE	*Poa secunda*	nfor	grami	POSA	*Poa sandbergii*	Sandberg's bluegrass
POWH2	*Poa wheeleri*	nfor	grami	PONEW	*Poa nervosa wheeleri*	wheeler's bluegrass
PSSPS	*Pseudoroegneria spicata ssp. spicata*	nfor	grami	AGSP	*Agropyron spicatum*	bluebunch wheatgrass
SPCR	*Sporobolus cryptandrus*	nfor	grami	SPCR	*Sporobolus cryptandrus*	sand dropseed
CYSC4	*Cytisus scoparius*	weed	shrub	CYSC	*Cytisus scoparius*	broom, Scotch
ACRE3	*Acroptilon repens*	weed	forb	ACRE3	*Acroptilon repens*	russian knapweed
CADR	*Cardaria draba*	weed	forb	CADR2	*Cardaria draba*	white top (hoary cress)
CANU4	*Carduus nutans*	weed	forb	CANU4	*Carduus nutans*	musk thistle
CEBI2	*Centaurea bieberstinii*	weed	forb	CEMA	*Centaurea maculosa*	spotted knapweed
CEDI3	*Centaurea diffusa*	weed	forb	CEDI	*Centaurea diffusa*	diffuse knapweed
CESO3	*Centaurea solstitialis*	weed	forb	CESO	*Centaurea solstitialis*	yellow starthistle
CHJU	*Chondrilla juncea*	weed	forb	CHJU	*Chondrilla juncea*	rush skeletonweed

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
CIAR4	*Cirsium arvense*	weed	forb	CIAR	*Cirsium arvense*	canada thistle
CIDO	*Cicuta douglasii*	weed	forb	CIDO	*Cicuta douglasii*	water hemlock
CIVU	*Cirsium vulgare*	weed	forb	CIVU	*Cirsium vulgare*	bull thistle
COMA2	*Conium maculatum*	weed	forb	COMA2	*Conium maculatum*	poison hemlock
CYOF	*Cynoglossum officinale*	weed	forb	CYOF	*Cynoglossum officinale*	hound's tongue
DIFU2	*Dipsacus fullonum*	weed	forb	DISY	*Dipsacus sylvestris*	teasel
EUES	*Euphorbia esula*	weed	forb	EUES	*Euphorbia esula*	leafy spurge
HEPU5	*Hemizonia pungens*	weed	forb	HEPU2	*Hemizonia pungens*	spikeweed
HYNI	*Hyoscyamus niger*	weed	forb	HYNI	*Hyoscyamus niger*	black henbane
HYPE	*Hypericum perforatum*	weed	forb	HYPE	*Hypericum perforatum*	common St. John's wort
LELA2	*Lepidium latifolium*	weed	forb	LELA	*Lepidium latifolium*	perennial pepperweed
LIDA	*Linaria dalmatica*	weed	forb	LIDA	*Linaria dalmatica*	dalmation toadflax
LIVU2	*Linaria vulgaris*	weed	forb	LIVU2	*Linaria vulgaris*	yellow toadflax
LYSA2	*Lythrum salicaria*	weed	forb	LYSA	*Lythrum salicaria*	purple loosestrife
ONAC	*Onopordum acanthium*	weed	forb	ONAC	*Onopordum acanthium*	scotch thistle
PORE5	*Potentilla recta*	weed	forb	PORE	*Potentilla recta*	cinquefoil, sulfur
SAAE	*Salvia aethiopis*	weed	forb	SAAE2	*Salvia aethiopis*	mediterranean sage
SAOF4	*Saponaria officinallis*	weed	forb	SAOF2	*Saponaria officinallis*	bounching bet, soapwort
SEJA	*Senecio jacobaea*	weed	forb	SEJA	*Senecio jacobaea*	tansy ragwort
TAVU	*Tanacetum vulgare*	weed	forb	TAVU	*Tanacetum vulgare*	common tansy
TRTE	*Tribulus terrestris*	weed	forb	TRTR	*Tribulus terrestris*	puncturevine
ZIVE	*Zigadenus venenosus*	weed	forb	ZIVE	*Zigadenus venenosus*	meadow deathcamus
CELO3	*Cenchrus longispinus*	weed	grami	CELO	*Cenchrus longispinus*	sandbur, longspine
DAGL	*Dactylis glomerata*	weed	grami	DAGL	*Dactylis glomerata*	orchard grass
LOLIU	*Lolium spp*	weed	grami	LOLIU	*Lolium spp*	ryegrass
PHPR3	*Phleum pratense*	weed	grami	PHPR	*Phleum pratense*	timothy
TACA8	*Taeniatherum caput-medusae*	weed	grami	TACA	*Taeniatherum caput-medusae*	medusa head
THIN6	*Thinopyrum intermedium*	weed	grami	AGIN2	*Agropyron intermedium*	intermediate wheatgrass
THIN6	*Thinopyrum intermedium*	weed	grami	AGTR2	*Agropyron trichophorum*	pubescent wheatgrass

SUBSECTION A.3.6 NW WASHINGTON

Mt. Baker-Snoqualmie (605), Olympic (609) National Forests.

ID Guide: Lesher, Robin D., and Jan A. Henderson. 1992. Indicator Species of Forested Plant Associations on National Forests of Northwestern Washington. USDA Forest Service, Pacific Northwest Region R6-MBS-TP-041-1992.

PLANTS	*PLANTS species*	Use	form	R6code	*R6 old species*	common_name
ACCI	*Acer circinatum*	indi	shrub	ACCI	*Acer circinatum*	vine maple
ARUV	*Arctostaphylos uva-ursi*	indi	shrub	ARUV	*Arctostaphylos uva-ursi*	bearberry, kinnikinnick
CHME	*Chimaphila menziesii*	indi	shrub	CHME	*Chimaphila menziesii*	little prince’s-pine
CHUM	*Chimaphila umbellata*	indi	shrub	CHUM	*Chimaphila umbellata*	prince's pine
ELPY	*Elliota pyroliflorus*	indi	shrub	CLPY	*Cladothamnus pyrolaeflorus*	copperbrush
FRPU7	*Frangula purshiana*	indi	shrub	RHPU	*Rhamnus purshiana*	cascara
GASH	*Gaultheria shallon*	indi	shrub	GASH	*Gaultheria shallon*	salal
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
JUCO6	*Juniperus communis*	indi	shrub	JUCO4	*Juniperus communis*	common juniper
LOHI2	*Lonicera hispidula*	indi	shrub	LOHI	*Lonicera hispidula*	hairy honeysuckle
MANE2	*Mahonia nervosa*	indi	shrub	BENE	*Berberis nervosa*	Oregon grape
OPHO	*Oplopanax horridus*	indi	shrub	OPHO	*Oplopanax horridus*	devil's club
ORSE	*Orthilia secunda*	indi	subshrub	PYSE	*Pyrola secunda*	sidebells pyrola
PAMY	*Paxistima myrsinites*	indi	shrub	PAMY	*Pachistima myrsinites*	Oregon boxwood
PHEM	*Phyllodoce empetriformis*	indi	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
RHAL2	*Rhododendron albiflorum*	indi	shrub	RHAL	*Rhododendron albiflorum*	cascades azalea
RHMA3	*Rhododendron macrophyllum*	indi	shrub	RHMA	*Rhododendron macrophyllum*	Pacific rhododendron
RIBR	*Ribes bracteosum*	indi	shrub	RIBR	*Ribes bracteosum*	stink currant
ROGY	*Rosa gymnocarpa*	indi	shrub	ROGY	*Rosa gymnocarpa*	baldhip rose
RULA2	*Rubus lasiococcus*	indi	shrub	RULA	*Rubus lasiococcus*	dwarf bramble
RUPE	*Rubus pedatus*	indi	shrub	RUPE	*Rubus pedatus*	five-leaved bramble
RUSP	*Rubus spectabilis*	indi	shrub	RUSP	*Rubus spectabilis*	salmonberry
SARA2	*Sambucus racemosa*	indi	shrub	SARA	*Sambucus racemosa*	red elderberry
SOSI2	*Sorbus sitchensis*	indi	shrub	SOSI	*Sorbus sitchensis*	Sitka mountain-ash
SYAL	*Symphoricarpos albus*	indi	shrub	SYAL	*Symphoricarpos albus*	common snowberry
VADE	*Vaccinium deliciosum*	indi	shrub	VADE	*Vaccinium deliciosum*	delicious blueberry
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAAL	*Vaccinium alaskense*	Alaska huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAOV	*Vaccinium ovalifolium*	oval-leaf huckleberry
VAOV2	*Vaccinium ovatum*	indi	shrub	VAOV2	*Vaccinium ovatum*	evergreen huckleberry
VAPA	*Vaccinium parvifolium*	indi	shrub	VAPA	*Vaccinium parvifolium*	red huckleberry
ACTR	*Achlys triphylla*	indi	forb	ACTR	*Achlys triphylla*	vanilla leaf
ATFI	*Athyrium filix-femina*	indi	forb	ATFI	*Athyrium filix-femina*	common ladyfern
BLSP	*Blechnum spicant*	indi	forb	BLSP	*Blechnum spicant*	deer fern
CALEH2	*Caltha leptosepala ssp. howellii*	indi	forb	CABI	*Caltha biflora*	two-flowered marsh-marigold
CASC7	*Campanula scouleri*	indi	forb	CASC2	*Campanula scouleri*	Scouler's harebell
CIAL	*Circaea alpina*	indi	forb	CIAL	*Circaea alpina*	enchanter's nightshade
CLSI2	*Claytonia sibirica*	indi	forb	MOSI	*Claytonia sibirica*	miner's lettuce
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly
COCA13	*Cornus canadensis*	indi	forb	COCA	*Cornus canadensis*	bunchberry
COME4	*Corallorhiza mertensiana*	indi	forb	COME	*Corallorhiza mertensiana*	western coralroot
DRCA11	*Dryopteris carthusiana*	indi	forb	DRAU2	*Dryopteris campyloptera*	shield-fern
ERMO8	*Erythronium montanum*	indi	forb	ERMO	*Erythronium montanum*	avalanche lily/giant faw
GATR3	*Galium triflorum*	indi	forb	GATR	*Galium triflorum*	sweetscented bedstraw

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
GOOB2	*Goodyera oblongifolia*	indi	forb	GOOB	*Goodyera oblongifolia*	western rattlesnake-plantain
GYDR	*Gymnocarpium dryopteris*	indi	forb	GYDR	*Gymnocarpium dryopteris*	oak fern
LEVU	*Leucanthemum vulgare*	weed	forb	CHLE2	*Chrysanthemum leucanthemum*	oxeye daisy
LIBO3	*Linnaea borealis*	indi	forb	LIBO2	*Linnaea borealis*	twinflower
LULA4	*Lupinus latifolius*	indi	forb	LULA	*Lupinus latifolius*	broadleaf lupine
LYAM3	*Lysichiton americanus*	indi	forb	LYAM	*Lysichiton americanum*	skunk cabbage
MADI	*Maianthemum dilatatum*	indi	forb	MADI2	*Maianthemum dilatatum*	false lily of the vally
MAST4	*Maianthemum stellatum*	indi	forb	SMST	*Smilacina stellata*	starry Solomon's seal
MOMA3	*Moehringia macrophylla*	indi	forb	ARMA3	*Arenaria macrophylla*	bigleaf sandwort
OXOR	*Oxalis oregana*	indi	forb	OXOR	*Oxalis oregana*	Oregon oxalis
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
STLAC	*Streptopus lanceolatus var. curvipes*	indi	forb	STRO	*Streptopus roseus*	rosy twistedstalk
STST3	*Streptopus streptopoides*	indi	forb	STST	*Streptopus streptopoides*	kruhsea twisted-stalk
TITR	*Tiarella trifoliata*	indi	forb	TITR	*Tiarella trifoliata*	threeleaf foamflower
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TIUN	*Tiarella unifoliata*	coolwort foamflower
TRBOL	*Trientalis borealis ssp. latifolia*	indi	forb	TRLA2	*Trientalis latifolia*	western starflower
VAHE	*Vancouveria hexandra*	indi	forb	VAHE	*Vancouveria hexandra*	white inside-out-flower
VASI	*Valeriana sitchensis*	indi	forb	VASI	*Valeriana sitchensis*	sitka valerian
XETE	*Xerophyllum tenax*	indi	forb	XETE	*Xerophyllum tenax*	beargrass
FEOC	*Festuca occidentalis*	indi	grami	FEOC	*Festuca occidentalis*	western fescue
ALVIS	*Alnus viridis ssp. sinuata*	nfor	shrub	ALSI	*Alnus sinuata*	sitka alder
ARUV	*Arctostaphylos uva-ursi*	nfor	shrub	ARUV	*Arctostaphylos uva-ursi*	bearberry, kinnikinnick
CAME7	*Cassiope mertensiana*	nfor	shrub	CAME	*Cassiope mertensiana*	western moss heather
ELPY	*Elliota pyroliflorus*	nfor	shrub	CLPY	*Cladothamnus pyrolaeflorus*	copperbrush
COSES	*Cornus sericia ssp. sericia*	nfor	shrub	COST	*Cornus stolonifera*	red-osier dogwood
DAFL3	*Dasiphora floribunda*	nfor	shrub	POFR	*Potentilla fruticosa*	shrubby cinquefoil
EMNI	*Empetrum nigrum*	nfor	shrub	EMNI	*Empetrum nigrum*	black crowberry
JUCO6	*Juniperus communis*	nfor	shrub	JUCO4	*Juniperus communis*	common juniper
KAMI	*Kalmia microphylla*	nfor	shrub	KAMI	*Kalmia microphylla*	alpine laurel
PHEM	*Phyllodoce empetriformis*	nfor	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
PHGL6	*Phyllodoce glanduliflora*	nfor	shrub	PHGL	*Phyllodoce glanduliflora*	tellow mountain-heath
RIBR	*Ribes bracteosum*	nfor	shrub	RIBR	*Ribes bracteosum*	stink currant
RUSP	*Rubus spectabilis*	nfor	shrub	RUSP	*Rubus spectabilis*	salmonberry
SABA3	*Salix barclayi*	nfor	shrub	SABA3	*Salix barclayi*	Barclay's willow
SACA6	*Salix cascadensis*	nfor	shrub	SACA6	*Salix cascadensis*	Cascade willow
SACO2	*Salix commutata*	nfor	shrub	SACO2	*Salix commutata*	undergreen willow
SANI8	*Salix nivalis*	nfor	shrub	SANI	*Salix nivalis*	snow willow
SASI2	*Salix sitchensis*	nfor	shrub	SASI2	*Salix sitchensis*	Sitka willow
SPDO	*Spiraea douglasii*	nfor	shrub	SPDO	*Spiraea douglasii*	Douglas spiraea
SPSPS	*Spiraea splendens var. splendens*	nfor	shrub	SPDE	*Spiraea densiflora*	rose meadowsweet
VADE	*Vaccinium deliciosum*	nfor	shrub	VADE	*Vaccinium deliciosum*	delicious blueberry
ANLA3	*Antennaria lanata*	nfor	forb	ANLA	*Antennaria lanata*	woolly pussytoes
CALEH2	*Caltha leptosepala ssp. howellii*	nfor	forb	CABI	*Caltha biflora*	two-flowered marsh-marigold
CAPA26	*Castilleja parviflora*	nfor	forb	CAPA3	*Castilleja parviflora*	mountain paintbrush
CARU9	*Castilleja rupicola*	nfor	forb	CARU4	*Castilleja rupicola*	cliff paintbrush

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
CHLA13	*Chamerion latifolium*	nfor	forb	EPLA	*Epilobium latifolium*	dwarf fireweed
DOJE	*Dodecatheon jeffreyi*	nfor	forb	DOJE	*Dodecatheon jeffreyi*	Sierra shootingstar
DOPU	*Dodecatheon pulchellum*	nfor	forb	DOPU2	*Dodecatheon pulchellum*	darkthroat shootingstar
EPAN4	*Epilobium anagallidifolium*	nfor	forb	EPAL	*Epilobium alpinum*	pimpernel willowherb
EQAR	*Equisetum arvense*	nfor	forb	EQAR	*Equisetum arvense*	common horsetail
EQFL	*Equisetum fluviatile*	nfor	forb	EQFL	*Equisetum fluviatile*	water horsetail
EQHY	*Equisetum hyemale*	nfor	forb	EQHY	*Equisetum hyemale*	scouringbrush horsetail
ERPE3	*Erigeron peregrinus*	nfor	forb	ERPE	*Erigeron peregrinus*	subalpine fleabane
HEMA80	*Heracleum maximum*	nfor	forb	HELA	*Heracleum lanatum*	common cowparsnip
LEPY	*Leptarrhena pyrolifolia*	nfor	forb	LEPY2	*Leptarrhena pyrolifolia*	fireleaf leptarrhena
LOMA5	*Lomatium martindalei*	nfor	forb	LOMA2	*Lomatium martindalei*	Cascade desertparsley
LULA4	*Lupinus latifolius*	nfor	forb	LULA	*Lupinus latifolius*	broadleaf lupine
LUPE	*Luetkea pectinata*	nfor	forb	LUPE	*Luetkea pectinata*	partridgefoot
METR3	*Menyanthes trifoliata*	nfor	forb	METR	*Menyanthes trifoliata*	buckbean
MILE2	*Mimulus lewisii*	nfor	forb	MILE	*Mimulus lewisii*	purple monkeyflower
NULUP	*Nuphar lutea ssp. polysepala*	nfor	forb	NUPO	*Nuphar polysepala*	Rocky Mountain pondlily
PEDA2	*Penstemon davidsonii*	nfor	forb	PEDA	*Penstemon davidsonii*	Davidson's penstemon
PEGR2	*Pedicularis groenlandica*	nfor	forb	PEGR	*Pedicularis groenlandica*	elephanthead
PHDI3	*Phlox diffusa*	nfor	forb	PHDI	*Phlox diffusa*	spreading phlox
POBI6	*Polygonum bistortoides*	nfor	forb	POBI	*Polygonum bistortoides*	American bistort
POFL3	*Potentilla flabellifolia*	nfor	forb	POFL2	*Potentilla flabellifolia*	high mountain cinquefoil
RAES	*Ranunculus eschscholtzii*	nfor	forb	RAES	*Ranunculus eschscholtzii*	Eschsholtz's buttercup
SABR6	*Saxifraga bronchialis*	nfor	forb	SABR	*Saxifraga bronchialis*	yellowdot saxifrage
SATO2	*Saxifraga tolmiei*	nfor	forb	SATO	*Saxifraga tolmiei*	Tolmie's saxifrage
SIAC	*Silene acaulis*	nfor	forb	SIAC	*Silene acaulis*	moss campion
VASI	*Valeriana sitchensis*	nfor	forb	VASI	*Valeriana sitchensis*	sitka valerian
VEVI	*Veratrum viride*	nfor	forb	VEVI	*Veratrum viride*	American false hellebore
VIPA4	*Viola palustris*	nfor	forb	VIPA2	*Viola palustris*	marsh violet
XETE	*Xerophyllum tenax*	nfor	forb	XETE	*Xerophyllum tenax*	beargrass
CACA4	*Calamagrostis canadensis*	nfor	grami	CACA	*Calamagrostis canadensis*	bluejoint reedgrass
CAIN11	*Carex interior*	nfor	grami	CAIN5	*Carex interior*	inland sedge
CALE8	*Carex lenticularis*	nfor	grami	CALE5	*Carex lenticularis*	lakeshore sedge
CANI2	*Carex nigricans*	nfor	grami	CANI2	*Carex nigricans*	black alpine sedge
CASP5	*Carex spectabilis*	nfor	grami	CASP	*Carex spectabilis*	showy sedge
ERAN6	*Eriophorum angustifolium*	nfor	grami	ERPO2	*Eriophorum polystachion*	many-spiked cotton-grass
FEOV	*Festuca ovina*	nfor	grami	FEOV	*Festuca ovina*	sheep fescue
FEVI	*Festuca viridula*	nfor	grami	FEVI	*Festuca viridula*	green fescue
JUDR	*Juncus drummondii*	nfor	grami	JUDR	*Juncus drummondii*	drummond rush
JUPA	*Juncus parryi*	nfor	grami	JUPA	*Juncus parryi*	Parry's rush
LUPI2	*Luzula piperi*	nfor	grami	HEGL	*Luzula piperi*	Piper's woodrush
SCMI2	*Scirpus microcarpus*	nfor	grami	SCMI	*Scirpus microcarpus*	small-fruit bulrush
SPAN2	*Sparganium angustifolium*	nfor	grami	SPAN	*Sparganium angustifolium*	narrowleaf burr-reed
BOTRY	*Botrychium spp.*	sens	forb	BOSPP	*Botrychium spp.*	grapeferns (genus)
COAS	*Coptis asplenifolia*	sens	forb	COAS	*Coptis asplenifolia*	spleen-leaved goldthread
ERRE5	*Erythronium revolutum*	sens	forb	ERRE	*Erythronium revolutum*	pink fawn lily
GAKA	*Galium kamtschaticum*	sens	forb	GAKA	*Galium kamtschaticum*	boreal bedstraw
PLFI2	*Pleuricospora fimbriloata*	sens	forb	PLFI2	*Pleuricospora fimbriloata*	fringed pinesap
CYSC4	*Cytisus scoparius*	weed	shrub	CYSC	*Cytisus scoparius*	broom, Scotch
CEBI2	*Centaurea bieberstinii*	weed	forb	CEMA	*Centaurea maculosa*	spotted knapweed

PLANTS	*PLANTS species*	Use	form	R6code	*R6 old species*	common_name
CEDET	*Centaurea debeauxii ssp. thuillieri*	weed	forb	CENIJ	*Centaurea jacea x nigra*	knapweed, meadow
CEDI3	*Centaurea diffusa*	weed	forb	CEDI	*Centaurea diffusa*	diffuse knapweed
CEJA	*Centaurea jacea*	weed	forb	CEJA	*Centaurea jacea*	brown knapweed
CENI3	*Centaurea nigrescens*	weed	forb	CENI4	*Centaurea nigrescens*	vochin knapweed
CESO3	*Centaurea solstitialis*	weed	forb	CESO	*Centaurea solstitialis*	yellow starthistle
LEVU	*Leucanthemum vulgare*	weed	forb	CHLE2	*Chrysanthemum leucanthemum*	oxeye daisy
CIAR4	*Cirsium arvense*	weed	forb	CIAR	*Cirsium arvense*	canada thistle
CIVU	*Cirsium vulgare*	weed	forb	CIVU	*Cirsium vulgare*	bull thistle
DACA6	*Daucus carota*	weed	forb	DACA4	*Daucus carota*	wild carrot
GERO	*Geranium robertianum*	weed	forb	GERO	*Geranium robertianum*	herb-Robert
HIAU	*Hieracium aurantiacum*	weed	forb	HIAU	*Hieracium aurantiacum*	hawkweed, orange
HICA10	*Hieracium caespitosum*	weed	forb	HICA	*Hieracium caespitosum*	yellow hawkweed
HYPE	*Hypericum perforatum*	weed	forb	HYPE	*Hypericum perforatum*	common st. john's wort
HYRA3	*Hypochaeris radicata*	weed	forb	HYRA	*Hypochaeris radicata*	catsear, spotted
LELA2	*Lepidium latifolium*	weed	forb	LELA	*Lepidium latifolium*	perennial pepperweed
LIDAD	*Linaria dalmatica ssp. dalmatica*	weed	forb	LIGED	*Linaria genistifolla dalmatatian*	dalmatian toadflax
LIVU2	*Linaria vulgaris*	weed	forb	LIVU2	*Linaria vulgaris*	yellow toadflax
LYSA2	*Lythrum salicaria*	weed	forb	LYSA	*Lythrum salicaria*	purple loosestrife
POCU6	*Polygonum cuspidatum*	weed	forb	POCU2	*Polygonum cuspidatum*	Japanese knotweed
PORE5	*Potentilla recta*	weed	forb	PORE	*Potentilla recta*	cinquefoil, sulfur
SEJA	*Senecio jacobaea*	weed	forb	SEJA	*Senecio jacobaea*	tansy ragwort
SOAR2	*Sonchus arvensis*	weed	forb	SOAR	*Sonchus arvensis*	perennial sowthistle
TAVU	*Tanacetum vulgare*	weed	forb	TAVU	*Tanacetum vulgare*	common tansy
VETH	*Verbascum thapsus*	weed	forb	VETH	*Verbascum thapsus*	mullein, common
CYESL	*Cyperus esculentus var. leptostachyus*	weed	grami	CYES	*Cyperus esculentus*	yellow nutsedge
PHAR3	*Phalaris arundinacea*	weed	grami	PHAR	*Phalaris arundinacea*	reed canarygrass

SUBSECTION A.3.7 SW WASHINGTON

Gifford Pinchot (603) National Forest.

ID Guide: Halverson, Nancy M. 1986. Major Indicator Shrubs and Herbs on National Forests of Western Oregon and Southwestern Washington. USDA Forest Service, Pacific Northwest Region R6-TM-229-1986.

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
ACCI	*Acer circinatum*	indi	shrub	ACCI	*Acer circinatum*	vine maple
AMAL2	*Amelanchier alnifolia*	indi	shrub	AMAL	*Amelanchier alnifolia*	Saskatoon serviceberry
ARNE	*Arctostaphylos nevadensis*	indi	shrub	ARNE	*Arctostaphylos nevadensis*	pinemat manzanita
ARUV	*Arctostaphylos uva-ursi*	indi	shrub	ARUV	*Arctostaphylos uva-ursi*	bearberry, kinnikinnick
CHUM	*Chimaphila umbellata*	indi	shrub	CHUM	*Chimaphila umbellata*	prince's pine
COCO6	*Corylus cornuta*	indi	shrub	COCO2	*Corylus cornuta*	California hazel
GASH	*Gaultheria shallon*	indi	shrub	GASH	*Gaultheria shallon*	salal
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
JUCO6	*Juniperus communis*	indi	shrub	JUCO4	*Juniperus communis*	common juniper
LOHI2	*Lonicera hispidula*	indi	shrub	LOHI	*Lonicera hispidula*	hairy honeysuckle
MAAQ2	*Mahonia aquifolium*	indi	shrub	BEAQ	*Berberis aquifolium*	tall Oregon grape
MANE2	*Mahonia nervosa*	indi	shrub	BENE	*Berberis nervosa*	Oregon grape
MEFE	*Menziesia ferruginea*	indi	shrub	MEFE	*Menziesia ferruginea*	fool's huckleberry
OPHO	*Oplopanax horridus*	indi	shrub	OPHO	*Oplopanax horridus*	devil's club
ORSE	*Orthilia secunda*	indi	subshrub	PYSE	*Pyrola secunda*	sidebells pyrola
PAMY	*Paxistima myrsinites*	indi	shrub	PAMY	*Pachistima myrsinites*	Oregon boxwood
PHEM	*Phyllodoce empetriformis*	indi	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
RHAL2	*Rhododendron albiflorum*	indi	shrub	RHAL	*Rhododendron albiflorum*	cascades azalea
RHMA3	*Rhododendron macrophyllum*	indi	shrub	RHMA	*Rhododendron macrophyllum*	Pacific rhododendron
ROGY	*Rosa gymnocarpa*	indi	shrub	ROGY	*Rosa gymnocarpa*	baldhip rose
RULA2	*Rubus lasiococcus*	indi	shrub	RULA	*Rubus lasiococcus*	dwarf bramble
RUPA	*Rubus parviflorus*	indi	shrub	RUPA	*Rubus parviflorus*	thimbleberry
RUPE	*Rubus pedatus*	indi	shrub	RUPE	*Rubus pedatus*	five-leaved bramble
RUSP	*Rubus spectabilis*	indi	shrub	RUSP	*Rubus spectabilis*	salmonberry
RUUR	*Rubus ursinus*	indi	shrub	RUUR	*Rubus ursinus*	Pacific blackberry
SYHE	*Symphoricarpos hesperius*	indi	shrub	SYMO	*Symphoricarpos mollis*	trailing snowberry
VADE	*Vaccinium deliciosum*	indi	shrub	VADE	*Vaccinium deliciosum*	delicious blueberry
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAOV	*Vaccinium ovalifolium*	oval-leaf huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAAL	*Vaccinium alaskense*	Alaska huckleberry
VAOV2	*Vaccinium ovatum*	indi	shrub	VAOV2	*Vaccinium ovatum*	evergreen huckleberry
VAPA	*Vaccinium parvifolium*	indi	shrub	VAPA	*Vaccinium parvifolium*	red huckleberry
VASC	*Vaccinium scoparium*	indi	shrub	VASC	*Vaccinium scoparium*	grouse huckleberry
WHMO	*Whipplea modesta*	indi	shrub	WHMO	*Whipplea modesta*	whipplevine
ACTR	*Achlys triphylla*	indi	forb	ACTR	*Achlys triphylla*	vanilla leaf
ADAL	*Adiantum aleuticum*	indi	forb	ADPE	*Adiantum pedatum*	maidenhar fern
ADBI	*Adenocaulon bicolor*	indi	forb	ADBI	*Adenocaulon bicolor*	trail plant
ANDE3	*Anemone deltoidea*	indi	forb	ANDE	*Anemone deltoidea*	threeleaf anemone
ARLA8	*Arnica latifolia*	indi	forb	ARLA	*Arnica latifolia*	broadleaf arnica
ASCA2	*Asarum caudatum*	indi	forb	ASCA3	*Asarum caudatum*	wild ginger
ATFI	*Athyrium filix-femina*	indi	forb	ATFI	*Athyrium filix-femina*	common ladyfern
BLSP	*Blechnum spicant*	indi	forb	BLSP	*Blechnum spicant*	deer fern
CLSI2	*Claytonia sibirica*	indi	forb	MOSI	*Claytonia sibirica*	miner's lettuce
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
COCA13	*Cornus canadensis*	indi	forb	COCA	*Cornus canadensis*	bunchberry
DRCA11	*Dryopteris carthusiana*	indi	forb	DRAU2	*Dryopteris campyloptera*	shield-fern
ERMO8	*Erythronium montanum*	indi	forb	ERMO	*Erythronium montanum*	avalanche lily/giant faw
EULEL2	*Eucephalus ledophyllus var. ledophyllus*	indi	forb	ASLE2	*Aster ledophyllus*	Cascades aster
FRVE	*Fragaria vesca*	indi	forb	FRVE	*Fragaria vesca*	woodland strawberry
GATR3	*Galium triflorum*	indi	forb	GATR	*Galium triflorum*	sweetscented bedstraw
GYDR	*Gymnocarpium dryopteris*	indi	forb	GYDR	*Gymnocarpium dryopteris*	oak fern
HIAL2	*Hieracium albiflorum*	indi	forb	HIAL	*Hieracium albiflorum*	white hawkweed
IRTE	*Iris tenax*	indi	forb	IRTE	*Iris tenax*	Oregon iris
LAPO3	*Lathyrus polyphyllus*	indi	forb	LAPO	*Lathyrus polyphyllus*	leafy pea vine
LEVU	*Leucanthemum vulgare*	weed	forb	CHLE2	*Chrysanthemum leucanthemum*	oxeye daisy
LIBO3	*Linnaea borealis*	indi	forb	LIBO2	*Linnaea borealis*	twinflower
LULA4	*Lupinus latifolius*	indi	forb	LULA	*Lupinus latifolius*	broadleaf lupine
LYAM3	*Lysichiton americanus*	indi	forb	LYAM	*Lysichiton americanum*	skunk cabbage
MADI	*Maianthemum dilatatum*	indi	forb	MADI2	*Maianthemum dilatatum*	false lily of the vally
MARA7	*Maianthemum racemosum*	indi	forb	SMRA	*Smilacina racemosa*	false Solomon's seal
MAST4	*Maianthemum stellatum*	indi	forb	SMST	*Smilacina stellata*	starry Solomon's seal
MIBR6	*Mitella breweri*	indi	forb	MIBR	*Mitella breweri*	Brewer's miterwort
MOMA3	*Moehringia macrophylla*	indi	forb	ARMA3	*Arenaria macrophylla*	bigleaf sandwort
OXOR	*Oxalis oregana*	indi	forb	OXOR	*Oxalis oregana*	Oregon oxalis
PODA	*Polygonum davisiae*	indi	forb	PONE4	*Polygonum newberryi*	Newberry's fleeceflower
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
PRHO2	*Prosartes hookeri*	indi	forb	DIHO	*Disporum hookeri*	Hooker fairybells
PTAQ	*Pteridium aquilinum*	indi	forb	PTAQ	*Pteridium aquilinum*	bracken fern
SAME7	*Saxifraga mertensiana*	indi	forb	SAME3	*Saxifraga mertensiana*	Merten's saxifrage
STLAC	*Streptopus lanceolatus var. curvipes*	indi	forb	STRO	*Streptopus roseus*	Rosy twistedstalk
STME	*Stachys mexicana*	indi	forb	STME2	*Stachys mexicana*	Mexican hedgenettle
SYRE	*Synthyris reniformis*	indi	forb	SYRE	*Synthyris reniformis*	snowqueen
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TITRU	*Tiarella trifoliata unifoliata*	coolwort foamflower
TRBOL	*Trientalis borealis ssp. latifolia*	indi	forb	TRLA2	*Trientalis latifolia*	western starflower
TROV2	*Trillium ovatum*	indi	forb	TROV	*Trillium ovatum*	white trillium
VAHE	*Vancouveria hexandra*	indi	forb	VAHE	*Vancouveria hexandra*	white inside-out-flower
VASI	*Valeriana sitchensis*	indi	forb	VASI	*Valeriana sitchensis*	sitka valerian
VIGL	*Viola glabella*	indi	forb	VIGL	*Viola glabella*	stream violet
XETE	*Xerophyllum tenax*	indi	forb	XETE	*Xerophyllum tenax*	beargrass
CAGE2	*Carex geyeri*	indi	grami	CAGE	*Carex geyeri*	elk sedge
CARU	*Calamagrostis rubescens*	indi	grami	CARU	*Calamagrostis rubescens*	pinegrass
FEID	*Festuca idahoensis*	indi	grami	FEID	*Festuca idahoensis*	idaho fescue
FEOC	*Festuca occidentalis*	indi	grami	FEOC	*Festuca occidentalis*	western fescue
FEVI	*Festuca viridula*	indi	grami	FEVI	*Festuca viridula*	green fescue
LUGLH	*Luzula glabrata var. hitchcockii*	indi	grami	LUHI	*Luzula hitchcokii*	smooth woodrush
CYSC4	*Cytisus scoparius*	weed	shrub	CYSC	*Cytisus scoparius*	broom, Scotch
CEBI2	*Centaurea bieberstinii*	weed	forb	CEMA	*Centaurea maculosa*	spotted knapweed
CEDET	*Centaurea debeauxii ssp. thuillieri*	weed	forb	CENIJ	*Centaurea jacea x nigra*	knapweed, meadow
CEDI3	*Centaurea diffusa*	weed	forb	CEDI	*Centaurea diffusa*	diffuse knapweed
CEJA	*Centaurea jacea*	weed	forb	CEJA	*Centaurea jacea*	brown knapweed

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
CENI3	*Centaurea nigrescens*	weed	forb	CENI4	*Centaurea nigrescens*	vochin knapweed
CESO3	*Centaurea solstitialis*	weed	forb	CESO	*Centaurea solstitialis*	yellow starthistle
LEVU	*Leucanthemum vulgare*	weed	forb	CHLE2	*Chrysanthemum leucanthemum*	oxeye daisy
CIAR4	*Cirsium arvense*	weed	forb	CIAR	*Cirsium arvense*	Canada thistle
CIVU	*Cirsium vulgare*	weed	forb	CIVU	*Cirsium vulgare*	bull thistle
DACA6	*Daucus carota*	weed	forb	DACA4	*Daucus carota*	wild carrot
GERO	*Geranium robertianum*	weed	forb	GERO	*Geranium robertianum*	herb-Robert
HIAU	*Hieracium aurantiacum*	weed	forb	HIAU	*Hieracium aurantiacum*	hawkweed, orange
HICA10	*Hieracium caespitosum*	weed	forb	HICA	*Hieracium caespitosum*	yellow hawkweed
HYPE	*Hypericum perforatum*	weed	forb	HYPE	*Hypericum perforatum*	common st. john's wort
HYRA3	*Hypochaeris radicata*	weed	forb	HYRA	*Hypochaeris radicata*	catsear, spotted
LELA2	*Lepidium latifolium*	weed	forb	LELA	*Lepidium latifolium*	perennial pepperweed
LIDAD	*Linaria dalmatica ssp. dalmatica*	weed	forb	LIGED	*Linaria genistifolla dalmatatian*	dalmatian toadflax
LIVU2	*Linaria vulgaris*	weed	forb	LIVU2	*Linaria vulgaris*	yellow toadflax
LYSA2	*Lythrum salicaria*	weed	forb	LYSA	*Lythrum salicaria*	purple loosestrife
POCU6	*Polygonum cuspidatum*	weed	forb	POCU2	*Polygonum cuspidatum*	Japanese knotweed
PORE5	*Potentilla recta*	weed	forb	PORE	*Potentilla recta*	cinquefoil, sulfur
SEJA	*Senecio jacobaea*	weed	forb	SEJA	*Senecio jacobaea*	tansy ragwort
SOAR2	*Sonchus arvensis*	weed	forb	SOAR	*Sonchus arvensis*	perennial sowthistle
TAVU	*Tanacetum vulgare*	weed	forb	TAVU	*Tanacetum vulgare*	common tansy
VETH	*Verbascum thapsus*	weed	forb	VETH	*Verbascum thapsus*	mullein, common
CYESL	*Cyperus esculentus var. leptostachyus*	weed	grami	CYES	*Cyperus esculentus*	yellow nutsedge
PHAR3	*Phalaris arundinacea*	weed	grami	PHAR	*Phalaris arundinacea*	reed canarygrass

SUBSECTION A.3.8 NE WASHINGTON

Colville (621), Okanogan (608), Wenatchee (617) National Forests.

ID Guide: Williams, Clinton K., and Terry R. Lillybridge. 1987. Major Indicator Shrubs and Herbs on National Forests of Eastern Washington, USDA Forest Service, Pacific Northwest Region R6-TM-TP-304-87

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
TABR2	*Taxus brevifolia*	indi	tree	TABR	*Taxus brevifolia*	western yew
ACCI	*Acer circinatum*	indi	shrub	ACCI	*Acer circinatum*	vine maple
ACGLD4	*Acer glabrum var. Douglasii*	indi	shrub	ACGLD	*Acer glabrum var. Douglasii*	Douglas maple
ALVIS	*Alnus viridis ssp. sinuata*	indi	shrub	ALSI	*Alnus sinuata*	sitka alder
AMAL2	*Amelanchier alnifolia*	indi	shrub	AMAL	*Amelanchier alnifolia*	Saskatoon serviceberry
ARNE	*Arctostaphylos nevadensis*	indi	shrub	ARNE	*Arctostaphylos nevadensis*	pinemat manzanita
ARTRV	*Artemisia tridentata ssp. vaseyana*	indi	shrub	ARTRV	*Artemisia tridentata vaseyana*	mountain big sagebrush
ARUV	*Arctostaphylos uva-ursi*	indi	shrub	ARUV	*Arctostaphylos uva-ursi*	bearberry, kinnikinnick
CESA	*Ceanothus sanguineus*	indi	shrub	CESA	*Ceanothus sanguineus*	redstem ceanothus
CEVE	*Ceanothus velutinus*	indi	shrub	CEVE	*Ceanothus velutinus*	snowbrush ceanothus
CHUMO 2	*Chimaphila umbellata ssp. occidentalis*	indi	shrub	CHUMO	*Chimaphila umbellata var. occidentalis*	western prince's pine
COSES	*Cornus sericia ssp. sericia*	indi	shrub	COST	*Cornus stolonifera*	red-osier dogwood
GAOV2	*Gaultheria ovatifolia*	indi	shrub	GAOV	*Gaultheria ovatifolia*	slender salal
HODI	*Holodiscus discolor*	indi	shrub	HODI	*Holodiscus discolor*	oceanspray
LEGL	*Ledum glandulosum*	indi	shrub	LEGL	*Ledum glandulosum*	western ledum
LOUT2	*Lonicera utahensis*	indi	shrub	LOUT2	*Lonicera utahensis*	Utah honeysuckle
MAAQ2	*Mahonia aquifolium*	indi	shrub	BEAQ	*Berberis aquifolium*	tall Oregon grape
MANE2	*Mahonia nervosa*	indi	shrub	BENE	*Berberis nervosa*	Oregon grape
MEFE	*Menziesia ferruginea*	indi	shrub	MEFE	*Menziesia ferruginea*	fool's huckleberry
OPHO	*Oplopanax horridus*	indi	shrub	OPHO	*Oplopanax horridus*	devil's club
ORSE	*Orthilia secunda*	indi	subshrub	PYSE	*Pyrola secunda*	sidebells pyrola
PAMY	*Paxistima myrsinites*	indi	shrub	PAMY	*Pachistima myrsinites*	Oregon boxwood
PHEM	*Phyllodoce empetriformis*	indi	shrub	PHEM	*Phyllodoce empetriformis*	pink mountain-heath
PHMA5	*Physocarpus malvaceus*	indi	shrub	PHMA	*Physocarpus malvaceus*	ninebark
PUTR2	*Purshia tridentata*	indi	shrub	PUTR	*Purshia tridentata*	bitterbrush
RHAL2	*Rhododendron albiflorum*	indi	shrub	RHAL	*Rhododendron albiflorum*	cascades azalea
RICE	*Ribes cereum*	indi	shrub	RICE	*Ribes cereum*	wax current
RILA	*Ribes lacustre*	indi	shrub	RILA	*Ribes lacustre*	prickly currant
RIVI3	*Ribes viscossissimum*	indi	shrub	RIVI	*Ribes viscossissimum*	sticky currant
ROGY	*Rosa gymnocarpa*	indi	shrub	ROGY	*Rosa gymnocarpa*	baldhip rose
ROSA5	*Rosa spp.*	indi	shrub	ROSA	*Rosa spp.*	rose
RULA2	*Rubus lasiococcus*	indi	shrub	RULA	*Rubus lasiococcus*	dwarf bramble
RUPA	*Rubus parviflorus*	indi	shrub	RUPA	*Rubus parviflorus*	thimbleberry
RUPE	*Rubus pedatus*	indi	shrub	RUPE	*Rubus pedatus*	five-leaved bramble
SASC	*Salix scouleriana*	indi	shrub	SASC	*Salix scouleriana*	Scouler's willow
SHCA	*Shepherdia canadensis*	indi	shrub	SHCA	*Shepherdia canadensis*	russet buffaloberry
SOSC2	*Sorbus scopulina*	indi	shrub	SOSC2	*Sorbus scopulina*	mountain ash
SPBEL	*Spiraea betulifolia var. lucida*	indi	shrub	SPBEL	*Spiraea betulifolia var. lucida*	shiny-leaf spirea
SYAL	*Symphoricarpos albus*	indi	shrub	SYAL	*Symphoricarpos albus*	common snowberry
SYHE	*Symphoricarpos hesperius*	indi	shrub	SYMOH	*Symphoricarpos mollis var. hesperius*	creeping snowberry

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
SYOR2	*Symphoricarpos oreophilus*	indi	shrub	SYOR	*Symphoricarpos oreophilus*	mountain snowberry
VACA13	*Vaccinium caespitosum*	indi	shrub	VACA	*Vaccinium caespitosum*	dwarf huckleberry
VADE	*Vaccinium deliciosum*	indi	shrub	VADE	*Vaccinium deliciosum*	delicious blueberry
VAME	*Vaccinium membranaceum*	indi	shrub	VAME	*Vaccinium membranaceum*	big huckleberry
VAMY2	*Vaccinium myrtillus*	indi	shrub	VAMY	*Vaccinium myrtillus*	low huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAOV	*Vaccinium ovalifolium*	oval-leaf huckleberry
VAOV	*Vaccinium ovalifolium*	indi	shrub	VAAL	*Vaccinium alaskense*	Alaska huckleberry
VAPA	*Vaccinium parvifolium*	indi	shrub	VAPA	*Vaccinium parvifolium*	red huckleberry
VASC	*Vaccinium scoparium*	indi	shrub	VASC	*Vaccinium scoparium*	grouse huckleberry
ACMI2	*Achillea millefolium*	indi	forb	ACMI	*Achillea millefolium*	Western Yarrow
ACRU2	*Actaea rubra*	indi	forb	ACRU	*Actaea rubra*	baneberry
ACTR	*Achlys triphylla*	indi	forb	ACTR	*Achlys triphylla*	vanilla leaf
ADBI	*Adenocaulon bicolor*	indi	forb	ADBI	*Adenocaulon bicolor*	trail plant
ARCO9	*Arnica cordifolia*	indi	forb	ARCO	*Arnica cordifolia*	heart-leaf arnica
ARLA8	*Arnica latifolia*	indi	forb	ARLA	*Arnica latifolia*	broadleaf arnica
ARNU2	*Aralia nudicaulis*	indi	forb	ARNU3	*Aralia nudicaulis*	wild sarsparilla
ASCA2	*Asarum caudatum*	indi	forb	ASCA3	*Asarum caudatum*	wild ginger
ASDE6	*Aspidotis densa*	indi	forb	ASDE	*Aspidotis densa*	rock fern
ATFI	*Athyrium filix-femina*	indi	forb	ATFI	*Athyrium filix-femina*	common ladyfern
BASA3	*Balsamorhiza sagittata*	indi	forb	BASA	*Balsamorhiza sagittata*	arrowleaf balsamroot
CANA5	*Cacaliopsis nardosima*	indi	forb	LUNA2	*Luina nardosima*	silvercrown
CLUN2	*Clintonia uniflora*	indi	forb	CLUN	*Clintonia uniflora*	queen's cup beadlilly
COCA13	*Cornus canadensis*	indi	forb	COCA	*Cornus canadensis*	bunchberry
DITR2	*Disporum trachycarpum*	indi	forb	DITR	*Disporum tracycarpum*	fairy bells
EQAR	*Equisetum arvense*	indi	forb	EQAR	*Equisetum arvense*	common horsetail
GATR3	*Galium triflorum*	indi	forb	GATR	*Galium triflorum*	sweetscented bedstraw
GYDR	*Gymnocarpium dryopteris*	indi	forb	GYDR	*Gymnocarpium dryopteris*	oak fern
HIAL2	*Hieracium albiflorum*	indi	forb	HIAL	*Hieracium albiflorum*	white hawkweed
LAPA5	*Lathyrus pauciflorus*	indi	forb	LAPA3	*Lathyrus pauciflorus*	few-flowered peavine
LIBOL2	*Linnaea borealis ssp. longiflora*	indi	forb	LIBOL	*Linnaea borealis longiflora*	western twinflower
LULA4	*Lupinus latifolius*	indi	forb	LULA	*Lupinus latifolius*	broadleaf lupine
LUSE4	*Lupinus sericeus*	indi	forb	LUSE	*Lupinus sericeus*	silky lupine
MARA7	*Maianthemum racemosum*	indi	forb	SMRA	*Smilacina racemosa*	false Solomon's seal
MAST4	*Maianthemum stellatum*	indi	forb	SMST	*Smilacina stellata*	starry Solomon's seal
MOMA3	*Moehringia macrophylla*	indi	forb	ARMA3	*Arenaria macrophylla*	Bigleaf Sandwort
OSBE	*Osmorhiza berteroi*	indi	forb	OSCH	*Osmorhiza chilensis*	sweet Cicely
PEBR	*Pedicularis bracteosa*	indi	forb	PEBR	*Pedicularis bracteosa*	bracted pedicularis
PERA	*Pedicularis racemosa*	indi	forb	PERA	*Pedicularis racemosa*	sickletop pedicularis
POMU	*Polystichum munitum*	indi	forb	POMU	*Polystichum munitum*	western swordfern
PRHO2	*Prosartes hookeri i*	indi	forb	DIHO	*Disporum hookeri*	Hooker fairybells
PTAQ	*Pteridium aquilinum*	indi	forb	PTAQ	*Pteridium aquilinum*	bracken fern
PYAS	*Pyrola asarifolia*	indi	forb	PYAS	*Pyrola asarifolia*	alpine pyrola
SETR	*Senecio triangularis*	indi	forb	SETR	*Senecio triangularis*	arrowleaf groundsel
STAM2	*Streptopus amplexifolius*	indi	forb	STAM	*Streptopus amplexifolius*	twisted stalk
STLAC	*Streptopus lanceolatus var. curvipes*	indi	forb	STRO	*Streptopus roseus*	rosy twistedstalk
THOC	*Thalictrum occidentale*	indi	forb	THOC	*Thalictrum occidentale*	western meadowrue
TITRU	*Tiarella trifoliata var. unifoliata*	indi	forb	TIUN	*Tiarella unifoliata*	coolwort foamflower

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
TRBOL	Trientalis borealis ssp. latifolia	indi	forb	TRLA2	*Trientalis latifolia*	western starflower
TRCA	Trautvetteria caroliniensis	indi	forb	TRCA3	*Trautvetteria caroliniensis*	false bugbane
TROV2	Trillium ovatum	indi	forb	TROV	*Trillium ovatum*	white trillium
VASI	Valeriana sitchensis	indi	forb	VASI	*Valeriana sitchensis*	Sitka valerian
VEVI	Veratrum viride	indi	forb	VEVI	*Veratrum viride*	American false hellebore
VIGL	Viola glabella	indi	forb	VIGL	*Viola glabella*	stream violet
VIOR	Viola orbiculata	indi	forb	VIOR2	*Viola orbiculata*	round-leaved violet
VIPU4	Viola purpurea	indi	forb	VIPU	*Viola purpurea*	goosefoot violet
XETE	Xerophyllum tenax	indi	forb	XETE	*Xerophyllum tenax*	beargrass
CACO11	Carex concinnoides	indi	grami	CACO	*Carex concinnoides*	northwestern sedge
CAGE2	Carex geyeri	indi	grami	CAGE	*Carex geyeri*	elk sedge
CARO5	Carex rossii	indi	grami	CARO	*Carex rossii*	ross' sedge
CARU	Calamagrostis rubescens	indi	grami	CARU	*Calamagrostis rubescens*	pinegrass
FEID	Festuca idahoensis	indi	grami	FEID	*Festuca idahoensis*	Idaho fescue
FEOC	Festuca occidentalis	indi	grami	FEOC	*Festuca occidentalis*	western fescue
LUGLH	*Luzula glabrata var. hitchcockii*	indi	grami	LUHI	*Luzula hitchcokii*	smooth woodrush
PSSPS	Pseudoroegneria spicata ssp. spicata	indi	grami	AGSP	*Agropyron spicatum*	bluebunch wheatgrass
CYSC4	Cytisus scoparius	weed	shrub	CYSC	*Cytisus scoparius*	broom, Scotch
ACRE3	Acroptilon repens	weed	forb	CERE	*Centaurea repens*	Russian knapweed
ANAR16	Anchusa arvensis	weed	forb	ANOF	*Anchusa arvensis*	bugloss, annual
CAAC	Carduus acanthoides	weed	forb	CAAC	*Carduus acanthoides*	thistle, plumeless
CADR	Cardaria draba	weed	forb	CADR2	*Cardaria draba*	white top (hoary cress)
CANU4	Carduus nutans	weed	forb	CANU4	*Carduus nutans*	musk thistle
CEBI2	Centaurea bieberstinii	weed	forb	CEMA	*Centaurea maculosa*	spotted knapweed
CECA2	Centaurea calcitrapa	weed	forb	CECA	*Centaurea calcitrapa*	starthistle, purple
CEDET	Centaurea debeauxii ssp. thuillieri	weed	forb	CENIJ	*Centaurea jacea x nigra*	knapweed, meadow
CEDI3	Centaurea diffusa	weed	forb	CEDI	*Centaurea diffusa*	diffuse knapweed
CESO3	Centaurea solstitialis	weed	forb	CESO	*Centaurea solstitialis*	yellow starthistle
CHJU	Chondrilla juncea	weed	forb	CHJU	*Chondrilla juncea*	rush skeletonweed
LEVU	*Leucanthemum vulgare*	weed	forb	CHLE2	*Chrysanthemum leucanthemum*	oxeye daisy
CIAR4	Cirsium arvense	weed	forb	CIAR	*Cirsium arvense*	canada thistle
CIVU	Cirsium vulgare	weed	forb	CIVU	*Cirsium vulgare*	bull thistle
CRVU2	Crupina vulgaris	weed	forb	CRVU	*Crupina vulgaris*	crupina, common
CYOF	Cynoglossum officinale	weed	forb	CYOF	*Cynoglossum officinale*	hound's tongue
ECVU	Echium vulgare	weed	forb	ECVU	*Echium vulgare*	blueweed
EUES	Euphorbia esula	weed	forb	EUES	*Euphorbia esula*	leafy spurge
HIAU	Hieracium aurantiacum	weed	forb	HIAU	*Hieracium aurantiacum*	hawkweed, orange
HICA10	Hieracium caespitosum	weed	forb	HIPR	*Hieracium pratense*	hawkweed, yellow
HYPE	Hypericum perforatum	weed	forb	HYPE	*Hypericum perforatum*	common st. john's wort
HYRA3	Hypochaeris radicata	weed	forb	HYRA	*Hypochaeris radicata*	catsear, spotted
ISTI	Isatis tinctoria	weed	forb	ISTI	*Isatis tinctoria*	dyers woad
LELA2	Lepidium latifolium	weed	forb	LELA	*Lepidium latifolium*	perennial pepperweed
LIDAD	Linaria dalmatica ssp. dalmatica	weed	forb	LIGED	*Linaria genistifolla dalmatatian*	dalmatian toadflax
LIVU2	Linaria vulgaris	weed	forb	LIVU2	*Linaria vulgaris*	yellow toadflax
LYSA2	Lythrum salicaria	weed	forb	LYSA	*Lythrum salicaria*	purple loosestrife
MINY	Mirabilis nyctaginea	weed	forb	MINY	*Mirabilis nyctaginea*	four o'clock, wild
MYSP2	Myriophyllum spicatum	weed	forb	MYSP2	*Myriophyllum spicatum*	Eurasian water-milfoil

PLANTS	PLANTS species	Use	form	R6code	R6 old species	common_name
ONAC	Onopordum acanthium	weed	forb	ONAC	*Onopordum acanthium*	scotch thistle
PORE5	Potentilla recta	weed	forb	PORE	*Potentilla recta*	cinquefoil, sulfur
SAPR2	Salvia pratensis	weed	forb	SAPR	*Salvia pratensis*	meadow clary (sage)
SEJA	Senecio jacobaea	weed	forb	SEJA	*Senecio jacobaea*	tansy ragwort
TAVU	Tanacetum vulgare	weed	forb	TAVU	*Tanacetum vulgare*	common tansy
VETH	Verbascum thapsus	weed	forb	VETH	*Verbascum thapsus*	mullein, common
AECY	Aegilops cylindrica	weed	grami	AECY	*Aegilops cylindrica*	goatgrass, jointed
CELO3	Cenchrus longispinus	weed	grami	CELO	*Cenchrus longispinus*	sandbur, longspine

APPENDIX B REFERENCE INFORMATION

SECTION B.1 STATE CODES

Code	State
06	California
16	Idaho *(used for R6 administered plots in Idaho)*
32	Nevada *(used for R5-administered plots in Nevada)*
41	Oregon
53	Washington

SECTION B.2 COUNTY CODES AND DECLINATIONS

SUBSECTION B.2.1 CALIFORNIA COUNTY CODES (06)

Code	County	Decl. East	Unit		Code	County	Decl. East	Unit
001	Alameda	13.0	CC		059	Orange	11.5	SO
003	Alpine	12.5	SJ		061	Placer	13.0	SA
005	Amador	13.0	SJ		063	Plumas	13.0	SA
007	Butte	13.0	SA		065	Riverside	11.0	SO
009	Calavaras	12.5	SJ		067	Sacramento	13.0	SA
011	Colusa	13.0	SA		069	San Benito	12.5	CC
013	Contra Costa	13.0	CC		071	San Bernardino	11.0	SO
015	Del Norte	14.0	NC		073	San Diego	11.0	SO
017	El Dorado	13.0	SA		075	San Francisco	13.0	CC
019	Fresno	12.5	SJ		077	San Joaquin	13.0	SJ
021	Glenn	13.5	SA		079	San Luis Obispo	12.0	CC
023	Humboldt	14.0	NC		081	San Mateo	13.0	CC
025	Imperial	11.5	SO		083	Santa Barbara	12.0	CC
027	Inyo	12.0	SO		085	Santa Clara	12.5	CC
029	Kern	12.0	SJ		087	Santa Cruz	12.5	CC
031	Kings	12.0	SJ		089	Shasta	13.5	NI
033	Lake	13.5	SA		091	Sierra	13.0	SA
035	Lassen	13.0	NI		093	Siskiyou	13.5	NI
037	Los Angeles	11.5	SO		095	Solano	13.0	CC
039	Madera	12.5	SJ		097	Sonoma	13.0	NC
041	Marin	13.0	CC		099	Stanislaus	12.5	SJ
043	Mariposa	12.5	SJ		101	Sutter	13.0	SA
045	Mendocino	13.5	NC		103	Tehama	13.5	SA
047	Merced	12.5	SJ		105	Trinity	13.5	NI
049	Modoc	13.5	NI		107	Tulare	12.0	SJ
051	Mono	12.5	SJ		109	Tuolumne	12.5	SJ
053	Monterey	12.5	CC		111	Ventura	11.5	CC
055	Napa	13.0	SA		113	Yolo	13.0	SA
057	Nevada	13.0	SA		115	Yuba	13.0	SA

- Units codes: (NC) North Coast, (NI) North Interior, (SA) Sacramento, (CC) Central Coast, (SJ) San Joaquin, (SO) Southern.

SUBSECTION B.2.2 OREGON COUNTY CODES (41)

Code	County	Declination degrees-East	Unit	East or West
001	Baker	13.5	B	E
003	Benton	14.5	WC	W
005	Clackamas	14.5	NW	W
007	Clatsop	15.0	NW	W
009	Columbia	14.5	NW	W
011	Coos	14.5	SW	W
013	Crook	14.0	C	E
015	Curry	14.0	SW	W
017	Deschutes	14.0	C	E
019	Douglas	14.0	SW	W
021	Gilliam	14.0	C	E
023	Grant	13.5	B	E
025	Harney	13.5	B	E
027	Hood River	14.5	NW	W
029	Jackson	14.0	SW	W
031	Jefferson	14.0	C	E
033	Josephine	14.0	SW	W
035	Klamath	14.0	C	E
037	Lake	13.5	C	E
039	Lane	14.5	WC	W
041	Lincoln	14.5	WC	W
043	Linn	14.5	WC	W
045	Malheur	13.0	B	E
047	Marion	14.5	NW	W
049	Morrow	14.0	B	E
051	Multnomah	14.5	NW	W
053	Polk	14.5	NW	W
055	Sherman	14.0	C	E
057	Tillamook	14.5	NW	W
059	Umatilla	14.0	B	E
061	Union	13.5	B	E
063	Wallowa	13.5	B	E
065	Wasco	14.0	C	E
067	Washington	14.5	NW	W
069	Wheeler	14.0	C	E
071	Yamhill	14.5	NW	W

- Western Oregon Unit codes: NW = Northwest, SW = Southwest, WC = Westcentral
- Eastern Oregon Unit codes: B = Blue Mountains, C = Central

SUBSECTION B.2.3 WASHINGTON COUNTY CODES (53)

Code	County	Declination Degrees - East	Unit	East or West
001	Adams	14.0	E	E
003	Asotin	13.5	E	E
005	Benton	14.0	E	E
007	Chelan	14.5	C	E
009	Clallam	15.5	OLY	W
011	Clark	14.5	SW	W
013	Columbia	13.5	E	E
015	Cowlitz	14.5	SW	W
017	Douglas	14.5	C	E
019	Ferry	14.5	E	E
021	Franklin	14.0	E	E
023	Garfield	13.5	E	E
025	Grant	14.5	E	E
027	Grays Harbor	15.0	OLY	W
029	Island	15.0	PS	W
031	Jefferson	15.0	OLY	W
033	King	15.0	PS	W
035	Kitsap	15.0	PS	W
037	Kittitas	14.5	C	E
039	Klickitat	14.5	C	E
041	Lewis	14.5	SW	W
043	Lincoln	14.0	E	E
045	Mason	15.0	OLY	W
047	Okanogan	14.5	C	E
049	Pacific	15.0	SW	W
051	Pend Oreille	14.0	E	E
053	Pierce	15.0	PS	W
055	San Juan	15.0	PS	W
057	Skagit	15.0	PS	W
059	Skamania	14.5	SW	W
061	Snohomish	15.0	PS	W
063	Spokane	14.0	E	E
065	Stevens	14.0	E	E
067	Thurston	15.0	OLY	W
069	Wahkiakum	15.0	SW	W
071	Walla Walla	14.0	E	E
073	Whatcom	15.0	PS	W
075	Whitman	13.5	E	E
077	Yakima	14.5	C	E

• Western Washington Unit Codes: OLY = Olympic Unit, PS = Puget Sound unit, SW = Southwest Unit
Eastern Washington Unit Codes: C = Central Washington Unit, E = Eastern Washington Unit

SUBSECTION B.2.4 IDAHO COUNTY CODES (16)

Code	County	Declination Degrees - East
49	Idaho	13.0
69	Nez Perce	13.5

SECTION B.3 SLOPE CORRECTION TABLE

Percent	Expansion Factor	Expansion Factor Reciprocal	-------Slope Distance-------			
			24.0 feet	58.9 feet	100 feet	185.1 feet
10	1.005	0.995	24.1	59.2	100.5	186.0
15	1.01	0.99	24.3	59.6	101.1	187.2
20	1.02	0.98	24.5	60.1	102.0	188.8
25	1.03	0.97	24.7	60.7	103.1	190.8
30	1.04	0.96	25.1	61.5	104.4	193.3
35	1.06	0.94	25.4	62.4	105.9	196.1
40	1.08	0.93	25.8	63.4	107.7	199.4
45	1.10	0.91	26.3	64.6	109.7	203.0
50	1.12	0.89	26.8	65.9	111.8	206.9
55	1.14	0.88	27.4	67.2	114.1	211.2
60	1.17	0.86	28.0	68.7	116.6	215.9
65	1.19	0.84	28.6	70.2	119.3	220.8
70	1.22	0.82	29.3	71.9	122.1	225.9
75	1.25	0.80	30.0	73.6	125.0	231.4
80	1.28	0.78	30.7	75.4	128.1	237.0
85	1.31	0.76	31.5	77.3	131.2	242.9
90	1.35	0.74	32.3	79.2	134.5	249.0
95	1.38	0.72	33.1	81.2	137.9	255.3
100	1.41	0.71	33.9	83.3	141.4	261.8
105	1.45	0.69	34.8	85.4	145.0	268.4
110	1.49	0.67	35.7	87.6	148.7	275.2
115	1.52	0.66	36.6	89.8	152.4	282.1
120	1.56	0.64	37.5	92.0	156.2	289.1
125	1.60	0.62	38.4	94.3	160.1	296.3
130	1.64	0.61	39.4	96.6	164.0	303.6
135	1.68	0.60	40.3	99.0	168.0	311.0
140	1.72	0.58	41.3	101.3	172.0	318.5
145	1.76	0.57	42.3	103.7	176.1	326.0
150	1.80	0.55	43.3	106.2	180.3	333.7
155	1.84	0.54	44.3	108.6	184.5	341.4

SECTION B.4 METRIC EQUIVALENTS AND AIDS

Length		
1 inch	=	2.54 centimeters (cm.)
0.1 feet	=	3.048 centimeters (cm.)
1 foot	=	0.3048 meter (m.)
1 mile	=	1.609 kilometers (km.)
1 centimeter (cm.)	=	.03 foot (ft.)
1 meter (m.)	=	3.2808 feet (ft.)
1 mile	=	5280 feet
Area		
1 acre	=	0.4 hectare (ha.) (approximately)
5 acres	=	2 hectares (ha.) (approximately)
1,000 acres	=	404.7 hectares (ha.)
1 hectare	=	2.471 acres (ac.)
2.5 hectares	=	6 acres (ac.) (approximately)
Volume		
1,000 cubic feet	=	28.3 meters (m3)
1 cubic foot per acre	=	0.07 cubic meter per hectare (m3/ha)
Condition Class Minimum Area		
0.4 hectares (1 acre)	=	4,000 square meters
	=	40 meters x 100 meters
	=	35 meter radius circle
1 acre	=	118 foot radius circle
	=	209 feet x 209 feet
	=	43,560 square feet
Metric System - Length		
1 meter	=	10 decimeters (dm.)
1 meter	=	100 centimeters (cm.)
1 meter	=	1,000 millimeters (mm.)
.001 meters	=	1 millimeter
.01 meters	=	1 centimeter
.1 meters	=	1 decimeter
1 meter	=	1 meter
10 meters	=	1 decameter
100 meters	=	1 hectometer
1,000 meters	=	1 kilometer
Photo Scales		
Scale	**Length on Photo**	**Length on Ground**
1:15,840	1 mm.	15.8 meters
1:24,000	1 mm.	24.0 meters
1:31,680	1 mm.	31.7 meters
1:40,000	1 mm.	40.0 meters
1:15,840	1 inch	1,320 feet
	0.1 inch	132 feet
	.05 inch (1/20)	66 feet
1:24,000	1 inch	2,000 feet
	0.1 inch	200 feet
	.05 inch (1/20)	100 feet
1:31,680	1 inch	2,640 feet
	0.1 inch	264 feet
	.05 inch (1/20)	132 feet
1:40,000	1 inch	3,333 feet
	0.1 inch	333 feet
	.05 inch (1/20)	166 feet

APPENDIX C PLANT ASSOCIATION REFERENCE

This appendix identifies which PLANT ASSOCIATION PUBLICATION (Item 5.7.2.73) to use to determine the PLANT ASSOCIATION (Item 5.7.2.71) for each plot. Note: "Plant association guide" and "plant association publication" are one in the same, and may be used interchangeably in this appendix.

SECTION C.1 OREGON

SUBSECTION C.1.1 COUNTY PLANT ASSOCIATION KEY

Baker Co.—see map on following pages
- north and east of US 80-: Wallowa-Snake PA Guide
- south and west of US 80: Blue Mountain PA Guide

Crook Co.—all: Blue Mountain PA Guide

Deschutes Co.—East Cascades PA Guide

Gilliam Co.—no PA Guide available

Grant Co.—all: Blue Mountain PA Guide

Harney Co.—north of US 20: Blue Mountain PA Guide

Hood River Co.—
- generally above 3000 feet: NW Oregon Cascades PA Guide
- generally below 3000 feet: Mt. Hood Ponderosa-Doug-fir-Grand Fir PA Guide

Jefferson Co.—see map on following pages
- timberlands on the Warm Springs Reservation: Warm Springs PA Guide
- south of Warm Springs Reservation and west from east half of Range 11E: East Cascades PA Guide
- east of Range 14E: Blue Mountain PA Guide
- east half of Range 11E east thru Range 14E: Crooked River Grasslands PA Guide

Klamath Co.—East Cascades PA Guide

Lake Co.—East Cascades PA Guide

Malhuer Co.—no PA Guide available

Morrow Co.—see map on following pages
- south of Township 2S: Blue Mountain PA Guide

Sherman Co.—no PA Guide available

Umatilla Co.—all: Blue Mountain PA Guide

Union Co.—see map on following pages
- east of US 80 and the Grande Ronde River: Wallowa-Snake PA Guide
- west of US 80 and the Grande Ronde River: Blue Mountain PA Guide

Wallowa Co.—see map on following pages
- east of the Grande Ronde River: Wallowa-Snake PA Guide
- west of the Grande Ronde River: Blue Mountain PA Guide

Wasco Co.—see map on following pages
- timberlands on the Warm Springs Reservation: Warm Springs PA Guide
- north of Warm Springs Reservation, generally above 3000 feet: NW Oregon Cascades PA Guide
- north of Warm Springs Reservation, generally below 3000 feet: Mt. Hood Ponderosa-Doug-fir-Grand Fir PA Guide

SUBSECTION C.1.2 OREGON PLANT ASSOCIATION PUBLICATIONS

Warm Springs Indian Reservation: Marsh, R.; Heliwell, R.; and Rogers, J. 1987. Plant association guide for the commercial forest of the Warm Springs Indian Reservation. Warm Springs, Oregon: Warm Springs Indian Reservation.

Willamette and Mt. Hood, westside: McCain, C.; Diaz, N. 2002. Field guide to the forested plant associations of the westside central Cascades of northwest Oregon. R6-NR-ECOL-TP-02-02. USDA Forest Service, Pacific Northwest Region.

Mt. Hood, eastside Hemlock zone (TSHE): Halverson, N. M.; Topik, C.; and Van Vickle, R. 1986. Plant Association and Management Guide for the Western Hemlock Zone, Mt. Hood National Forest. R6-ECOL-232A-1986. USDA Forest Service, Pacific Northwest Region.

Mt. Hood, eastside Ponderosa, Douglas-fir, and Grand fir zones (PIPO, PSME, ABGR): Topik, C.; Halverson, N. M.; and High, T. 1988. Plant Association and Management Guide for the Ponderosa Pine, Douglas-fir, and Grand Fir Zones, Mt. Hood National Forest. R6-ECOL-TP-004-88. USDA Forest Service, Pacific Northwest Region.

Siuslaw, not Oregon Dunes: McCain, C.; Diaz, N. 2002. Field guide to the forested plant associations of the northern Oregon Coast Range. R6-NR-ECOL-TP-03-02. USDA Forest Service, Pacific Northwest Region.

Siuslaw, Oregon Dunes NRA: Christy, J. A.; Kagan, J. S.; and Wiedemann, A. M. 1986. Plant Associations of the Oregon Dunes National Recreation Area. R6-NR-ECOL-TP-09-98. USDA Forest Service, Pacific Northwest Region.

Atzet, T.; White, D. E.; McCrimmon, L. A.; Martinez, P. A.; et al.1996. Field Guide to the Forested Plant Associations of Southwestern Oregon. Technical Paper R6-NR-ECOL-TP-17-96. USDA Forest Service, Pacific Northwest Region.

Deschutes, Winema, and Fremont: Simpson, Michael. 2007. Forested Plant Associations of the Oregon East Cascades. USDA Forest Service, Pacific Northwest Region R6-NR-ECOL-TP-2007

Ochoco: Johnson, C. Jr.; and Clausnitzer, R. 1992. Plant Associations of the Blue and Ochoco Mountains. R6-ERW-TP-036-92. USDA Forest Service, Pacific Northwest Region.

Crooked River grasslands and PIPO (Ochoco): Hopkins, W.; and Kovalchik, B. 1983. Plant Associations of the Crooked River National Grasslands, Ochoco National Forest. R6-ECOL-133-1983. USDA Forest Service, Pacific Northwest Region.

RIPARIAN, all forests: Kovalchik, B. 1987. Riparian Zone Associations: Deschutes, Ochoco, Fremont, and Winema National Forests. R6-ECOL-TP-279-87. USDA Forest Service, Pacific Northwest Region.

Wallowa-Whitman National Forest (Wallowa Valley, Hells Canyon NRA, Eagle Cap, Pine, and eastern portion of La Grande Districts): Johnson, C.G. Jr.; Simon, S. A. 1987. Plant Associations of the Wallowa-Snake Province, Wallowa-Whitman National Forest. R6-ECOL-TP-255B-86. USDA Forest Service, Pacific Northwest Region.

Malheur National Forest, Umatilla National Forest, and Wallowa-Whitman National Forest (Unity, Baker, and western portion of La Grande Districts): Johnson, C. G. Jr.; Claunitzer, R. R. 1992. Plant Associations of the Blue and Ochoco Mountains, Wallowa-Whitman National Forest. R6-ERW-TP-036-92. USDA Forest Service, Pacific Northwest Region.

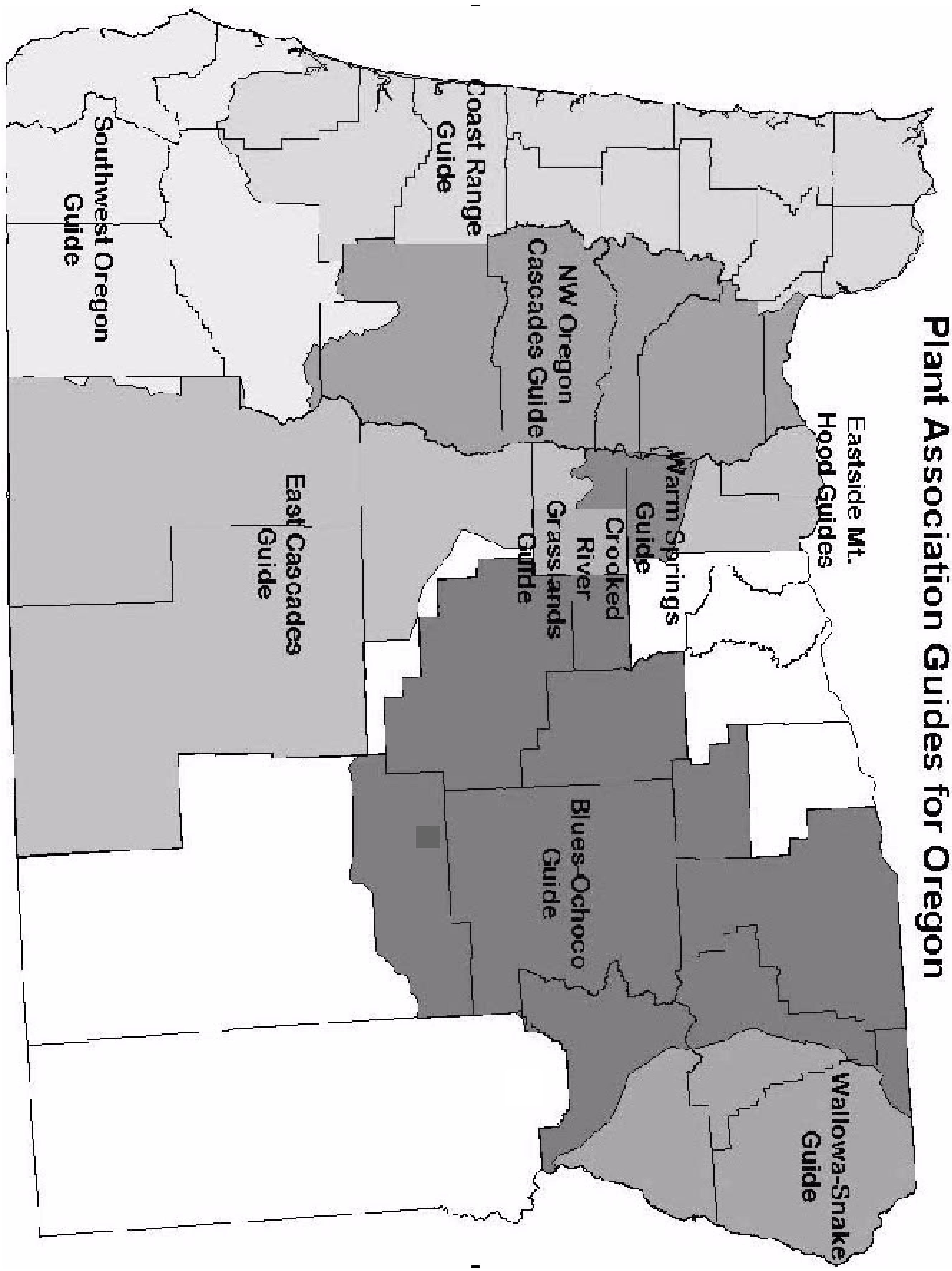


Figure C.1: Oregon plant association guides

SUBSECTION C.1.3 OREGON INDICATOR PLANT ID GUIDES

Halverson, N. M. 1986. Major Indicator Shrubs and Herbs on National Forests of Western Oregon and Southwestern Washington. R6-TM-229-1986. USDA Forest Service, Pacific Northwest Region.

Seda, A.; Atzet, T.; and Wheeler, D. 1989 (updated 1997). Key Species for Plant Associations on the Rogue River, Siskiyou, and Umpqua National Forests. R6-NR-ECOL-TP-026-97. USDA Forest Service, Pacific Northwest Region.

Uplands: Hopkins, W.; and Rawlings, R. 1988 (revised version). Major Indicator Shrubs and Herbs on National Forests of Eastern Oregon. R6-TM-190-1985. USDA Forest Service, Pacific Northwest Region.

Johnson, C. G. Jr. 1993. Common Plants of the Inland Pacific Northwest, Malheur, Umatilla, Wallowa-Whitman National Forests. R6-ERW-TP051-93. USDA Forest Service, Pacific Northwest Region.

Riparian: Kovalchik, B. L.; Hopkins, W. E.; and Brunsfeld, S. J. 1988. Major Indicator Shrubs and Herbs in Riparian Zones on National Forests of Central Oregon. R6-ECOL-TP-005-88. USDA Forest Service, Pacific Northwest Region.

Noxious and sensitive: Hopkins, W. E.; and Garrett, S. 1990. Sensitive Plant—Animal and Noxious Weeds Guide for Deschutes, Fremont, Ochoco and Winema National Forests—Area IV. R6-DES-TP-017-90. USDA Forest Service, Pacific Northwest Region.

Johnson, C. G. Jr. 1993. Common Plants of the Inland Pacific Northwest, Malheur, Umatilla, Wallowa-Whitman National Forests. R6-ERW-TP051-93. USDA Forest Service, Pacific Northwest Region.

SECTION C.2 WASHINGTON

SUBSECTION C.2.1 COUNTY PLANT ASSOCIATION KEY

Asotin Co. (3)—south of Grande Ronde River: Wallowa-Snake PA Guide

Asotin Co. (3)—north of Grande Ronde River: Blue Mountain PA Guide

Columbia Co. (13)—all: Blue Mountain PA Guide

Cowlitz Co. (15)—west of I5: Olympic PA Guide; east of I5: Gifford-Pinchot PA Guide

Ferry Co. (19)—North of the Colville reservation: Colville NF PA Guide; south of the Colville reservation's north border: Colville Reservation PA Guide

Garfield Co. (23)—all: Blue Mountain PA Guide

Klickitat Co. (39)—on National Forest: Gifford-Pinchot PA Guides; east of National Forest: Wenatchee PA Guide

Lewis Co. (41)—west of I5: Olympic PA Guide; east of I5: Gifford-Pinchot PA Guide

Lincoln Co. (43)—Northeast section: Spokane Reservation PA Guide

Okanagon Co. (47)—west of the Okanogan River: Wenatchee PA Guide; east of Okanogan River and north of the Colville Reservation: Colville National Forest PA Guide; east of Okanogan River and south of the Colville Reservation's north border: Colville Reservation PA Guide

Skagit Co. (57)—east of North Cascades National Park: Wenatchee PA Guide; otherwise: Mt. Baker-Snoqualmie PA Guide

Spokane Co. (63)—No Plant Association Guides Available

Stevens Co. (65)—North of the Spokane Reservation: Colville National Forest PA Guide; south of the Spokane Reservation's north border: Spokane Reservation PA Guide

Thurston Co. (67)—west of I5: Olympic PA Guide; east of I5: Gifford-Pinchot PA Guides

Walla Walla Co. (71)—all: Blue Mountain PA Guide

Whatcom Co. (73)—east of North Cascades National Park: Wenatchee PA Guide; otherwise: Mt. Baker Snoqualmie PA Guide

Yakima Co. (77)—on National Forest: Gifford-Pinchot PA Guides; east of National Forest: Wenatchee PA Guide; Yakama Reservation and north of Yakama Reservation: Wenatchee PA Guide

SUBSECTION C.2.2 WASHINGTON PLANT ASSOCIATION PUBLICATIONS

Colville Indian Reservation: Forest habitat types of the Colville Indian Reservation. 1987. Clausnitzer, R.R. and Zamora, B.A. MISC0110. Pullman, Washington: Washington State University, Agricultural Research Center.

Spokane Indian Reservation: Forest habitat types of the Spokane Indian Reservation. 1883. Zamora, B.A. Research Bulletin XB-0936. Pullman, Washington: Washington State University, Agricultural Research Center.

Mt. Baker-Snoqualmie: Henderson, J.A.; Lesher, R.D.; Peter, D. H.; and Shaw, D.C.1992. Field Guide to the Forested Plant Associations Of The Mt. Baker-Snoqualmie National Forest. Technical Paper R6-ECOL-TP-028-91. USDA Forest Service, Pacific Northwest Region.

Olympic: Henderson, J.A.; Lesher, R.D.; Peter, D. H.; and Shaw, D.C. 1989. Forested Plant Associations Of The Olympic National Forest. Technical Paper R6-ECOL-TP-001-88. USDA Forest Service, Pacific Northwest Region.

Non-forest: Hall, Frederick C. 1998. Pacific Northwest ecoclass codes for seral and potential natural communities. General Technical Report PNW-GTR-418. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.

Colville National Forest and Okanogan National Forest east of the Okanogan River: Williams, C. K.; Lillybridge, T. R.; and Smith, B. G. 1995. Forested Plant Associations of the Colville National Forest. PNW-GTR-360. USDA Forest Service, Pacific Northwest Research Station.

Wenatchee National Forest and Okanogan National Forest west of Okanogan River: Lillybridge, T. R.; Kovalchik, B. R.; Williams, C. K.; and Smith, B. G. 1995. Field Guide for Forested Plant Associations of the Wenatchee National Forest. PNW-GTR-359. USDA Forest Service, Pacific Northwest Research Station.

ABAM Zone: Brockway, D.G.; Topik, C.; Hemstrom, M. A.; and Emmingham, W. H. 1983. Plant Association and Management Guide for the Pacific Silver Fir Zone, Gifford Pinchot National Forest. R6-Ecol-130a-1983. USDA Forest Service, Pacific Northwest Region.

TSME Zone: Diaz, N. M.; High, C. T.; Mellen, T. K.; et al. 1997. Plant Association and Management Guide for the Mountain Hemlock Zone, Gifford Pinchot and Mt. Hood National Forests. R6-MTH-GP-TP-08-95. USDA Forest Service, Pacific Northwest Region.

TSHE Zone: Topik, C.; Halverson, N. M.; and Brockway, D. G. 1986. Plant Association and Management Guide for the Western Hemlock Zone, Gifford Pinchot National Forest. R6-ECOL-230A-1986. USDA Forest Service, Pacific Northwest Region.

ABGR Zone: Topik, C. 1989. Plant Association and Management Guide for the Grand Fir Zone Gifford Pinchot National Forest. USDA Forest Service, Pacific Northwest Region R6-Ecol-TP-006-88.

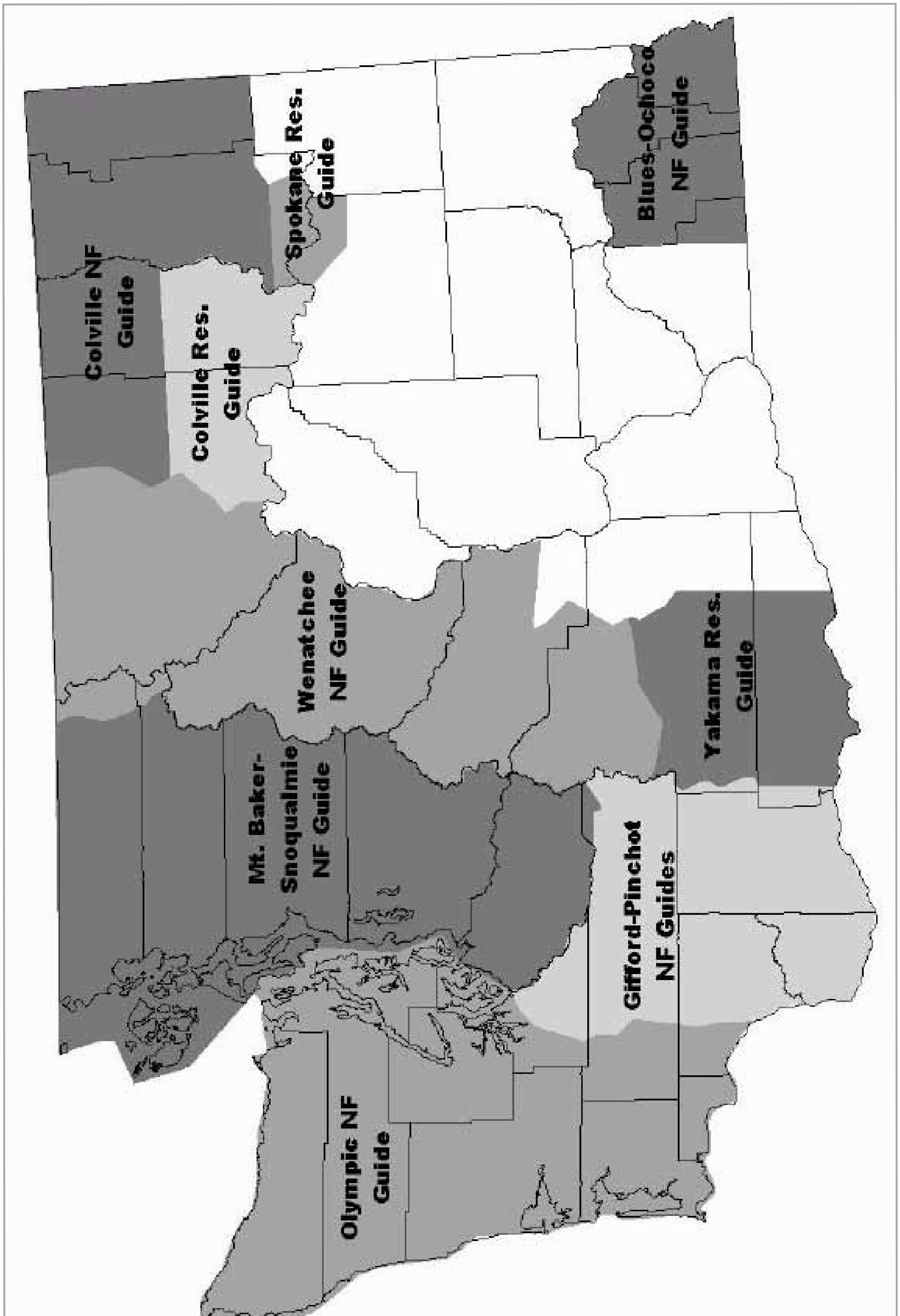


Figure C.2: Washington plant association guides

SUBSECTION C.2.3 WASHINGTON INDICATOR PLANT ID GUIDES

Lesher, R. D. and Jan A. Henderson. 1992. Indicator Species of Forested Plant Associations on National Forests of Northwestern Washington. MBS-TP-041-1992. USDA Forest Service, Pacific Northwest Region R6.

Non-forest, weed, or sensitive plants: No Guide. Use Hitchcock, C.L.; and Cronquist, A. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, WA. or Pojar, J.; and MacKinnon, A. 1994. Plants of the Pacific Northwest Coast. Lone Pine Publishing, Vancouver, BC.

Halverson, N.M. 1986. Major Indicator Shrubs and Herbs on National Forests of Western Oregon and Southwestern Washington. R6-TM-229-1986. USDA Forest Service, Pacific Northwest Region.

Williams, C. K.; and Lillybridge, T.R. 1987. Major Indicator Shrubs and Herbs on National Forests of Eastern Washington. R6-TM-TP-304-87. USDA Forest Service, Pacific Northwest Region.

Weeds: Smith-Kuebel, C.; and Lillybridge, T. R. Sensitive Plants and Noxious Weeds of the Wenatchee National Forest. R6-WEN-93-014. USDA Forest Service, Wenatchee National Forest.

APPENDIX D FIA TREE SPECIES CODES

SECTION D.1 FIA TREE SPECIES CODES

This list includes all tree species tallied by FIA. Conifer species are listed first (sorted by genus), followed by hardwoods (sorted by genus). The Islands Only Species (IOS) column and the Mainland NFS P2/3 Sub-lists column indicate where the species are excluded even though the species is tallied in the islands or in other NFS regions. The Past Tally columns indicate how the species were tallied in a specific FIA region in previous years (AK = Alaska, C = Caribbean, P = Pacific, PNWS = Pacific Northwest South excluding Alaska, R = regional mainland on the region's tally list in field guide version 8.0, and U = urban on the tally list in field guide version 8.0). Species designated Caribbean (c), Pacific (P), and Urban (U) are commonly found in those areas, although species designated for one area may occasionally be found in another. Woodland species designate species where DRC is measured instead of DBH. Species designated as being Historic P2 species (P2) were collected as part of the P2 annual inventory, excluding the Caribbean and Pacific Islands, prior to Field Guide version 9.0.

Note that Appendix D in any field guide version is a snapshot in time of the species code list for a specific data collection period. The date at the top of the page is the beginning date of the collection period. The Master Species List is a living document and the most up-to-date version can be accessed online (https://www.fia.fs.fed.us/library/field-guides-methods-proc/index.php) via the national FIA public web site (https://www.fia.fs.fed.us/).

SUBSECTION D.1.1 MASTER SPECIES LIST FOOTNOTES

The following footnotes are used in the Master Tree Species List:

a. Master Species List (MSL)
b. Islands Only Species (IOS) - Not valid on the Mainland
c. Mainland NFS P2/P3 Sub-lists - Not valid on P2/P3 plots within a specific NFS Region
d. Entries in this column also contain the variety name when the variety clarifies the species, or subspecies name when the subspecies clarifies the species.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
Softwoods																
MSL	.	.	.	11	Pacific silver fir	Abies	amabilis	ABAM	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	12	balsam fir	Abies	balsamea	ABBA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	14	Santa Lucia or bristlecone fir	Abies	bracteata	ABBR	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	15	white fir	Abies	concolor	ABCO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	16	Fraser fir	Abies	fraseri	ABFR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	17	grand fir	Abies	grandis	ABGR	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	18	corkbark fir	Abies	lasiocarpa var. arizonica	ABLAA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	19	subalpine fir	Abies	lasiocarpa	ABLA	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	20	California red fir	Abies	magnifica	ABMA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	22	noble fir	Abies	procera	ABPR	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	21	Shasta red fir	Abies	shastensis	ABSH	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	6154	parana pine	Araucaria	angustifolia	ARAN15	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6155	New Caledonia pine	Araucaria	columnaris	ARCO32	U	P, U	U	U	.	P	U	.
MSL	.	.	.	6157	Norfolk Island pine	Araucaria	heterophylla	ARHE12	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6331	Callitris columellaris	Callitris	columellaris	CACO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	81	incense-cedar	Calocedrus	decurrens	CADE27	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	5420	Atlas cedar	Cedrus	atlantica	CEAT4	U	U	U	U	.	.	U	.
MSL	.	.	.	5423	Deodar cedar	Cedrus	deodara	CEDE2	U	U	U	U	.	.	U	.
MSL	.	.	.	5421	cedar of Lebanon	Cedrus	libani	CELI6	U	U	U	U	.	.	U	.
MSL	.	.	.	41	Port-Orford-cedar	Chamaecyparis	lawsoniana	CHLA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	42	Alaska yellow-cedar	Chamaecyparis	nootkatensis	CHNO	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	5443	hinoki false cypress	Chamaecyparis	obtusa	CHOB8	U	U	U	U	.	.	U	.
MSL	.	.	.	5444	sawara-cypress	Chamaecyparis	pisifera	CHPI12	.	.	.	.	.	.	.	.
MSL	.	.	.	43	Atlantic white-cedar	Chamaecyparis	thyoides	CHTH2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6786	Japanese cedar	Cryptomeria	japonica	CRJA3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6788	Chinese fir	Cunninghamia	lanceolata	CULA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	5800	Leyland cypress	Cupressocyparis	leylandii	CULE2	U	U	U	U	.	.	U	.
MSL	.	.	.	51	Arizona cypress	Cupressus	arizonica	CUAR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	52	Baker or Modoc cypress	Cupressus	bakeri	CUBA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	53	Tecate cypress	Cupressus	forbesii	CUFO2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	6795	cedar-of-Goa	Cupressus	lusitanica	CULU2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	56	MacNab's cypress	Cupressus	macnabiana	CUMA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	54	Monterey cypress	Cupressus	macrocarpa	CUMA2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	55	Sargent's cypress	Cupressus	sargentii	CUSA3	R, U	PNWS, U	U	U	.	.	.	P2
MSL	.	.	.	6796	Italian cypress	Cupressus	sempervirens	CUSE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	w	61	Ashe juniper	Juniperus	ashei	JUAS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL				7486	Bermuda juniper	Juniperus	bermudiana	JUBE3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	w	62	California juniper	Juniperus	californica	JUCA7	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	7489	Chinese juniper	Juniperus	chinensis	JUCH4	.	U	U	U	.	.	U	.
MSL	.	.	w	59	redberry juniper	Juniperus	coahuilensis	JUCO11	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	63	alligator juniper	Juniperus	deppeana	JUDE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	60	Drooping juniper	Juniperus	flaccida	JUFL	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	w	69	oneseed juniper	Juniperus	monosperma	JUMO	R, U	PNWS, U	R, U	R, U	.	.	.	P2

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	64	western juniper	Juniperus	occidentalis	JUOC	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	w	65	Utah juniper	Juniperus	osteosperma	JUOS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	58	Pinchot juniper	Juniperus	pinchotii	JUPI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	66	Rocky Mountain juniper	Juniperus	scopulorum	JUSC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	67	southern redcedar	Juniperus	virginiana var. silicicola	JUVIS	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	68	eastern redcedar	Juniperus	virginiana	JUVI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6212	European larch	Larix	decidua	LADE2	U	U	U	U	.	.	U	P2
MSL	.	.	.	74	Japanese larch	Larix	kaempferi	LAKA2	.	.	.	.	.	.	.	.
MSL	.	.	.	71	tamarack	Larix	laricina	LALA	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	72	subalpine larch	Larix	lyallii	LALY	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	73	western larch	Larix	occidentalis	LAOC	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	75	Siberian larch	Larix	sibirica	LASI3	.	.	.	.	.	.	.	.
MSL	.	3,4,5,6,10	.	70	larch spp.	Larix	spp.	LARIX	R, U	U	U	U	.	.	.	P2
MSL	.	.	.	7779	dawn redwood	Metasequoia	glyptostroboides	MEGL8	U	U	U	U	.	.	U	.
MSL	.	.	.	91	Norway spruce	Picea	abies	PIAB	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	92	Brewer spruce	Picea	breweriana	PIBR	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	93	Engelmann spruce	Picea	engelmannii	PIEN	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	94	white spruce	Picea	glauca	PIGL	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6533	Sakhalin spruce	Picea	glehnii	PIGL7	U	U	U	U	.	.	U	.
MSL	.	.	.	95	black spruce	Picea	mariana	PIMA	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6538	Serbian spruce	Picea	omorika	PIOM2	U	U	U	U	.	.	U	.
MSL	.	.	.	96	blue spruce	Picea	pungens	PIPU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	97	red spruce	Picea	rubens	PIRU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	98	Sitka spruce	Picea	sitchensis	PISI	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	101	whitebark pine	Pinus	albicaulis	PIAL	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	102	Rocky Mountain bristlecone pine	Pinus	aristata	PIAR	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	135	Arizona pine	Pinus	arizonica	PIAR5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	103	knobcone pine	Pinus	attenuata	PIAT	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	104	foxtail pine	Pinus	balfouriana	PIBA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	105	jack pine	Pinus	banksiana	PIBA2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8200	Bunge's pine	Pinus	bungeana	PIBU2	U	U	U	U	.	.	U	.
MSL	.	.	.	8201	Canary Island pine	Pinus	canariensis	PICA15	U	U	U	U	.	.	U	.
MSL	.	.	.	8183	Caribbean pine	Pinus	caribaea	PICA18	U	P, U	U	C, U	C	P	.	.
MSL	.	.	w	140	Mexican pinyon pine	Pinus	cembroides	PICE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	107	sand pine	Pinus	clausa	PICL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	108	lodgepole pine	Pinus	contorta	PICO	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	109	Coulter pine	Pinus	coulteri	PICO3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8189	Japanese red pine	Pinus	densiflora	PIDE5	U	U	U	U	.	.	U	.
MSL	.	.	w	134	border pinyon	Pinus	discolor	PIDI3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	110	shortleaf pine	Pinus	echinata	PIEC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	106	common or two-needle pinyon	Pinus	edulis	PIED	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	111	slash pine	Pinus	elliottii	PIEL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	144	Honduras pine	Pinus	elliottii var. elliottii	PIELE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	112	Apache pine	Pinus	engelmannii	PIEN2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	113	limber pine	Pinus	flexilis	PIFL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	115	spruce pine	Pinus	glabra	PIGL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8202	aleppo pine	Pinus	halepensis	PIHA7	U	U	U	U	.	.	U	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	116	Jeffrey pine	Pinus	jeffreyi	PIJE	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	117	sugar pine	Pinus	lambertiana	PILA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	118	Chihuahuan pine	Pinus	leiophylla	PILE	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	142	Great Basin bristlecone pine	Pinus	longaeva	PILO	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8184	Chinese red pine	Pinus	massoniana	PIMA11	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8185	Merkus pine	Pinus	merkusii	PIME2	U	U	U	C, U	C	.	.	.
MSL	.	.	w	133	singleleaf pinyon	Pinus	monophylla	PIMO	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	w	143	Arizona pinyon pine	Pinus	monophylla var. fallax	PIMOF	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	119	western white pine	Pinus	monticola	PIMO3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	120	bishop pine	Pinus	muricata	PIMU	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	136	Austrian pine	Pinus	nigra	PINI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8186	ocote chino	Pinus	oocarpa	PIOO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	121	longleaf pine	Pinus	palustris	PIPA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8197	five-needle pine	Pinus	parviflora	PIPA12	U	U	U	U	.	.	U	.
MSL	.	.	.	8187	Mexican weeping pine	Pinus	patula	PIPA13	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8188	maritime pine	Pinus	pinaster	PIPI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8203	Italian stone pine	Pinus	pinea	PIPI7	U	U	U	U	.	.	U	.
MSL	.	.	.	122	ponderosa pine	Pinus	ponderosa	PIPO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	123	Table Mountain pine	Pinus	pungens	PIPU5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	138	four-leaf or Parry pinyon pine	Pinus	quadrifolia	PIQU	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	124	Monterey pine	Pinus	radiata	PIRA2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	w	141	papershell pinyon pine	Pinus	remota	PIRE5	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	125	red pine	Pinus	resinosa	PIRE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	126	pitch pine	Pinus	rigida	PIRI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8182	Indian longleaf pine	Pinus	roxburghii	PIRO2	U	U	U	U	.	.	U	.
MSL	.	.	.	127	gray or California foothill pine	Pinus	sabiniana	PISA2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	128	pond pine	Pinus	serotina	PISE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	114	southwestern white pine	Pinus	strobiformis	PIST3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	129	eastern white pine	Pinus	strobus	PIST	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	130	Scotch pine	Pinus	sylvestris	PISY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	131	loblolly pine	Pinus	taeda	PITA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8198	Japanese black pine	Pinus	thunbergii	PITH2	U	U	U	U	.	.	U	.
MSL	.	.	.	139	Torrey pine	Pinus	torreyana	PITO	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	132	Virginia pine	Pinus	virginiana	PIVI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	137	Washoe pine	Pinus	washoensis	PIWA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8249	Oriental arborvitae	Platycladus	orientalis	PLOR80	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8274	yew plum pine	Podocarpus	macrophyllus	POMA32	U	U	U	U	.	.	U	.
MSL	.	.	.	201	bigcone Douglas-fir	Pseudotsuga	macrocarpa	PSMA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	202	Douglas-fir	Pseudotsuga	menziesii	PSME	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	211	redwood	Sequoia	sempervirens	SESE3	R, U	PNWS, P, U	R, U	U	.	P	.	P2
MSL	.	.	.	212	giant sequoia	Sequoiadendron	giganteum	SEGI2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	222	pondcypress	Taxodium	ascendens	TAAS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	221	baldcypress	Taxodium	distichum	TADI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	223	Montezuma baldcypress	Taxodium	mucronatum	TAMU	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	8738	English yew	Taxus	baccata	TABA80	U	U	U	U	.	.	U	.
MSL	.	.	.	231	Pacific yew	Taxus	brevifolia	TABR2	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	8739	Japanese yew	Taxus	cuspidata	TACU	U	U	U	U	.	.	U	.
MSL	.	.	.	232	Florida yew	Taxus	floridana	TAFL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	241	northern white-cedar	Thuja	occidentalis	THOC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	242	western redcedar	Thuja	plicata	THPL	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	251	California torreya (nutmeg)	Torreya	californica	TOCA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	252	Florida torreya (nutmeg)	Torreya	taxifolia	TOTA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	299	unknown dead conifer	Tree	evergreen	2TE	R, U	PNWS, AK, U	R, U	P2, U	.	.	.	P2
MSL	.	.	.	261	eastern hemlock	Tsuga	canadensis	TSCA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	262	Carolina hemlock	Tsuga	caroliniana	TSCA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	263	western hemlock	Tsuga	heterophylla	TSHE	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	264	mountain hemlock	Tsuga	mertensiana	TSME	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
Hardwoods																
MSL	.	.	.	6001	blackbrush wattle	Acacia	anegadensis	ACAN4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6002	mulga	Acacia	aneura	ACAN10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6003	auri	Acacia	auriculiformis	ACAU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6004	small Philippine acacia	Acacia	confusa	ACCO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6016	silver wattle	Acacia	dealbata	ACDE3	U	U	U	U	.	.	U	.
MSL	.	.	.	6017	green wattle	Acacia	decurrens	ACDE	U	U	U	U	.	.	U	.
MSL	.	3	w	303	sweet acacia	Acacia	farnesiana	ACFA	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	6006	koa	Acacia	koa	ACKO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6007	koaoha	Acacia	koaia	ACKO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6019	Sydney golden wattle	Acacia	longifolia	ACLO	U	U	U	U	.	.	U	.
MSL	.	.	.	6008	porknut	Acacia	macracantha	ACMA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6009	black wattle	Acacia	mangium	ACMA12	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6010	black wattle	Acacia	mearnsii	ACME80	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6011	blackwood	Acacia	melanoxylon	ACME	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6012	spineless wattle	Acacia	muricata	ACMU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6013	gum arabic tree	Acacia	nilotica	ACNI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6014	South Wales wattle	Acacia	parramattensis	ACPA81	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6015	Acacia polyacantha	Acacia	polyacantha	ACPO3	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	300	acacia spp.	Acacia	spp.	ACACI	R, U	P, U	U	C, U	C	P	.	P2
MSL	.	.	.	6018	poponax	Acacia	tortuosa	ACTO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6020	prickly Moses	Acacia	verticillata	ACVE2	U	U	U	U	.	.	U	.
MSL	.	.	.	311	Florida maple	Acer	barbatum	ACBA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5145	hedge maple	Acer	campestre	ACCA5	U	U	U	U	.	.	U	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL		5,6,10	.	5146	vine maple	Acer	circinatum	ACCI	U	U	U	U	.	.	U	.
MSL	.	.	.	5147	Amur maple	Acer	ginnala	ACGI	U	U	U	U	.	.	U	.
MSL	.	.	w	322	bigtooth maple	Acer	grandidentatum	ACGR3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5148	paperbark maple	Acer	griseum	ACGR14	U	U	U	U	.	.	U	.
MSL	.	.	.	323	chalk maple	Acer	leucoderme	ACLE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	312	bigleaf maple	Acer	macrophyllum	ACMA3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	5155	Miyabe maple	Acer	miyabei	ACMI7	U	U	U	U	.	.	U	.
MSL	.	.	.	5149	Painted maple	Acer	mono	ACMO10	U	U	U	U	.	.	U	.
MSL	.	.	.	313	boxelder	Acer	negundo	ACNE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	314	black maple	Acer	nigrum	ACNI5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5150	Japanese maple	Acer	palmatum	ACPA2	U	U	U	U	.	.	U	.
MSL	.	.	.	315	striped maple	Acer	pensylvanicum	ACPE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	320	Norway maple	Acer	platanoides	ACPL	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	5157	Norway maple x shantung maple	Acer	platanoides x truncatum	ACPL2	U	U	U	U	.	.	U	.
MSL	.	.	.	5151	sycamore maple	Acer	pseudoplatanus	ACPS	U	U	U	U	.	.	U	.
MSL	.	.	.	316	red maple	Acer	rubrum	ACRU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	317	silver maple	Acer	saccharinum	ACSA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	318	sugar maple	Acer	saccharum	ACSA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	319	mountain maple	Acer	spicatum	ACSP2	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	5152	tatarian maple	Acer	tataricum	ACTA80	U	U	U	U	.	.	U	.
MSL	.	.	.	5156	Three Flower Maple	Acer	triflorum	ACTR7	U	U	U	U	.	.	U	.
MSL	.	.	.	5154	Freeman maple	Acer	x freemanii	ACFR	U	U	U	U	.	.	U	.
MSL	.	.	.	6021	hollowheart	Acnistus	arborescens	ACAR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	906	Everglades palm, paurotis-palm	Acoelorraphe	wrightii	ACWR4	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	6023	grugru palm	Acrocomia	media	ACME2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6025	baobab	Adansonia	digitata	ADDI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6026	wild lime	Adelia	ricinella	ADRI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6028	red beadtree	Adenanthera	pavonina	ADPA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6032	Caribbean spiritweed	Aegiphila	martinicensis	AEMA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	333	California buckeye	Aesculus	californica	AECA	R, U	PNWS, U	U	U	.	.	.	P2
MSL	.	.	.	332	yellow buckeye	Aesculus	flava	AEFL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	331	Ohio buckeye	Aesculus	glabra	AEGL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	334	Texas buckeye	Aesculus	glabra var.arguta	AEGLA	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	5163	horse chestnut	Aesculus	hippocastanum	AEHI	U	U	U	U	.	.	U	.
MSL	.	.	.	6034	yellowwood	Afrocarpus	falcatus	AFFA	U	U	U	U	.	.	U	.
MSL	.	.	.	6035	East African yellowwood	Afrocarpus	gracilior	AFGR	U	U	U	U	.	.	U	.
MSL	.	.	.	6036	kauri	Agathis	australis	AGAU4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6037	Queensland kauri	Agathis	robusta	AGRO6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6042	Titimel	Aglaia	mariannensis	AGMA14	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6044	karasyu, marasau	Aglaia	ponapensis	AGPO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6046	laga ali	Aglaia	samoensis	AGSA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6048	Olomea	Aidia	cochinchinensis	AICO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6049	Aidia racemosa	Aidia	racemosa	AIRA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	341	ailanthus	Ailanthus	altissima	AIAL	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
MSL	.	.	.	6053	Aiphanes minima	Aiphanes	minima	AIMI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6055	cream albizia	Albizia	adinocephala	ALAD	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6056	naked albizia	Albizia	carbonaria	ALCA8	U	U	U	C, U	C	.	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6057	Chinese albizia	Albizia	chinensis	ALCH2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	345	mimosa, silktree	Albizia	julibrissin	ALJU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6059	woman's tongue	Albizia	lebbeck	ALLE	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6060	tall albizia	Albizia	procera	ALPR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6061	ukall ra ngebard	Albizia	retusa	ALRE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6062	whiteflower albizia	Albizia	saponaria	ALSA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6064	achiotillo	Alchornea	latifolia	ALLA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6066	palo de gallina	Alchorneopsis	floribunda	ALFL3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6069	Hawaii alectryon	Alectryon	macrococcus	ALMA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6075	Indian walnut	Aleurites	moluccana	ALMO2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6078	lumbang	Aleurites	trisperma	ALTR11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6080	palo blanco	Allophylus	crassinervis	ALCR9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6082	palo de caja	Allophylus	racemosus	ALRA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6084	chebeludes	Allophylus	ternatus	ALTE13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6085	ebeludes, chebeludes	Allophylus	timorensis	ALTI2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5189	Italian alder	Alnus	cordata	ALCO13	U	U	U	U	.	.	U	.
MSL	.	.	.	355	European alder	Alnus	glutinosa	ALGL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6086	Nepal alder	Alnus	nepalensis	ALNE2	U	P, U	U	U	.	P	U	.
MSL	.	.	.	353	Arizona alder	Alnus	oblongifolia	ALOB2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	352	white alder	Alnus	rhombifolia	ALRH2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	351	red alder	Alnus	rubra	ALRU2	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	6088	chelebiob, elebiong	Alphitonia	carolinensis	ALCA21	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6089	Hawaii kauilatree	Alphitonia	ponderosa	ALPO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6091	toi	Alphitonia	zizyphoides	ALZI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6092	helecho gigante de la sierra	Alsophila	bryophila	ALBR4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6093	Alsophila portoricensis	Alsophila	portoricensis	ALPO7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6095	deviltree	Alstonia	macrophylla	ALMA16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6096	Alstonia pacifica	Alstonia	pacifica	ALPA22	U	P, U	U	U	.	P	.	.
MSL	.	.	.	357	common serviceberry	Amelanchier	arborea	AMAR3	.	U	U	U	.	.	.	P2
MSL	.	.	.	5203	Allegheny serviceberry	Amelanchier	laevis	AMLA	.	U	U	U	.	.	U	.
MSL	.	.	.	358	roundleaf serviceberry	Amelanchier	sanguinea	AMSA	.	U	U	U	.	.	.	P2
MSL	.	5,6,10	.	356	serviceberry spp.	Amelanchier	spp.	AMELA	R, U	U	.	R, U	.	.	.	P2
MSL	.	.	.	6101	black calabash	Amphitecna	latifolia	AMLA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6103	balsam torchwood	Amyris	balsamifera	AMBA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	852	sea torchwood	Amyris	elemifera	AMEL	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	6107	cashew	Anacardium	occidentale	ANOC	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6108	Anacolosa glochidiiformis	Anacolosa	glochidiiformis	ANGL5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6109	Anacolosa insularis	Anacolosa	insularis	ANIN13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6111	Anadenanthera peregrina	Anadenanthera	peregrina	ANPE13	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6114	cabbagebark tree	Andira	inermis	ANIN	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6120	canelillo	Aniba	bracteata	ANBR7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6124	Annona cherimola	Annona	cherimola	ANCH9	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6125	ilama	Annona	diversifolia	ANDI11	U	U	U	C, U	C	.	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	853	pond-apple	Annona	glabra	ANGL4	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	6127	mountain soursop	Annona	montana	ANMO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6128	soursop	Annona	muricata	ANMU2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6129	custard apple	Annona	reticulata	ANRE	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6131	sugar apple	Annona	squamosa	ANSQ	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6137	Antidesma bunius	Antidesma	bunius	ANBU3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6138	Antidesma kusaiense	Antidesma	kusaiense	ANKU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6135	Kapua china laurel	Antidesma	kapuae	ANKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6139	ha a	Antidesma	platyphyllum	ANPL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6143	hame	Antidesma	pulvinatum	ANPU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6146	placa chiquitu	Antirhea	acutata	ANAC4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6147	pegwood	Antirhea	coriacea	ANCO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6148	Antirhea inconspicua	Antirhea	inconspicua	ANIN2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6149	palo iloron	Antirhea	lucida	ANLU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6150	quina roja	Antirhea	obtusifolia	ANOB2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6151	Puerto Rico quina	Antirhea	portoricensis	ANPO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6152	Sintenis' quina	Antirhea	sintenisii	ANSI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	5232	Japanese angelica tree	Aralia	elata	AREL8	U	U	U	U	.	.	U	.
MSL	.	.	.	362	Arizona madrone	Arbutus	arizonica	ARAR2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	361	Pacific madrone	Arbutus	menziesii	ARME	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	6180	strawberry tree	Arbutus	unedo	ARUN4	.	U	U	U	.	.	U	.
MSL	.	.	w	363	Texas madrone	Arbutus	xalapensis	ARXA80	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	6159	Alexandra palm	Archontophoenix	alexandrae	ARAL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6160	Bangalow palm	Archontophoenix	cunninghamiana	ARCU2	U	U	U	U	.	.	U	.
MSL	IOS	.	.	6161	shoebutton	Ardisia	elliptica	AREL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6162	ausubon	Ardisia	glauciflora	ARGL11	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6163	mountain marlberry	Ardisia	luquillensis	ARLU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6164	Guadeloupe marlberry	Ardisia	obovata	AROB2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6165	China-shrub	Ardisia	solanacea	ARSO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6167	betelnut	Areca	catechu	ARCA41	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6169	cabo-negro	Arenga	pinnata	ARPI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6171	breadfruit	Artocarpus	altilis	ARAL7	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6173	Artocarpus heterophyllus	Artocarpus	heterophyllus	ARHE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6175	dugdug, Marianas breadfruit	Artocarpus	mariannensis	ARMA28	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6176	Artocarpus nobilis	Artocarpus	nobilis	ARNO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6177	Marang	Artocarpus	odoratissimus	AROD2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6179	taputoi	Arytera	brackenridgei	ARBR11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6181	afia	Ascarina	diffusa	ASDI14	U	P, U	U	U	.	P	.	.
MSL	.	.	.	367	pawpaw	Asimina	triloba	ASTR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6184	Astronidium kusaianum	Astronidium	kusaianum	ASKU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6185	Astronidium navigatorum	Astronidium	navigatorum	ASNA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6186	mesekui	Astronidium	palauense	ASPA37	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6187	Astronidium pickeringii	Astronidium	pickeringii	ASPI11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6188	Astronidium samoense	Astronidium	samoense	ASSA23	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6190	Astronidium subcordata	Astronidium	subcordata	ASSU31	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6193	ifi ifi	Atuna	racemosa	ATRA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6197	Bilimbi	Averrhoa	bilimbi	AVBI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6198	carambola	Averrhoa	carambola	AVCA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	986	black mangrove	Avicennia	germinans	AVGE	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	6203	Avicennia marina	Avicennia	marina	AVMA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6200	biut	Avicennia	Marina ssp.Marina	AVAL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6206	neem	Azadirachta	indica	AZIN2	U	P, U	U	C, U	C	.	.	.
MSL	.	.	.	6208	Saitamu	Baccaurea	taitensis	BATA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5261	peach palm	Bactris	gasipaes	BAGA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6213	ralm	Badusa	palauensis	BAPA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6217	Puerto Rico palo de ramon	Banara	portoricensis	BAPO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6219	Vanderbilt's palo de ramon	Banara	vanderbiltii	BAVA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6220	sea putat	Barringtonia	asiatica	BAAS3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6221	langaasag	Barringtonia	racemosa	BARA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6222	falaga	Barringtonia	samoensis	BASA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6224	Bastardiopsis eggersii	Bastardiopsis	eggersii	BAEG6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6241	Texasplume	Bauhinia	lunarioides	BALU	U	U	U	U	.	.	U	.
MSL	.	.	.	6226	Napoleon's plume	Bauhinia	monandra	BAMO2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6227	petite flamboyant bauhinia	Bauhinia	multinervia	BAMU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6228	railroadfence	Bauhinia	pauletia	BAPA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6229	butterfly tree	Bauhinia	purpurea	BAPU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6231	St. Thomas tree	Bauhinia	tomentosa	BATO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6232	mountain ebony	Bauhinia	variegata	BAVA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6252	bauhinia	Bauhinia	x blakeana	BABL	U	U	U	U	.	.	U	.
MSL	.	.	.	6233	slugwood	Beilschmiedia	pendula	BEPE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6235	Caribbean myrtlecroton	Bernardia	dichotoma	BEDI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	371	yellow birch	Betula	alleghaniensis	BEAL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	372	sweet birch	Betula	lenta	BELE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	376	resin birch	Betula	neoalaskana	BENE4	R, U	AK	R, U	U	.	.	.	P2
MSL	.	.	.	373	river birch	Betula	nigra	BENI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	374	water birch	Betula	occidentalis	BEOC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	375	paper birch	Betula	papyrifera	BEPA	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5279	European white birch	Betula	pendula	BEPE3	U	U	U	U	.	.	U	.
MSL	.	.	.	5280	Asian white birch	Betula	platyphylla	BEPL2	U	U	U	U	.	.	U	.
MSL	.	.	.	379	gray birch	Betula	populifolia	BEPO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5281	downy birch	Betula	pubescens	BEPU5	U	U	U	U	.	.	U	.
MSL	.	.	.	377	Virginia roundleaf birch	Betula	uber	BEUB	R, U	PNWS, U	R, U	R, U	.	.	.	P2

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	378	northwestern paper birch	Betula	x utahensis	BEUT	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	6236	Javanese bishopwood	Bischofia	javanica	BIJA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6238	lipsticktree	Bixa	orellana	BIOR	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6240	akee	Blighia	sapida	BLSA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6242	akupa	Bobea	brevipes	BOBR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6243	ahakea lau nui	Bobea	elatior	BOEL3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6244	Hawaii dogweed	Bobea	sandwicensis	BOSA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6246	ahakea	Bobea	timonioides	BOTI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6247	parrotweed	Bocconia	frutescens	BOFR2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6250	virgata	Boehmeria	virgata	BOVI7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6251	white alling	Bontia	daphnoides	BODA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6253	Bourreria radula	Bourreria	radula	BORA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6255	bodywood	Bourreria	succulenta	BOSU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6257	roble de guayo	Bourreria	virgata	BOVI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6258	pink flame tree	Brachychiton	discolor	BRDI6	U	U	U	U	.	.	U	.
MSL	.	.	.	6259	whiteflower kurrajong	Brachychiton	populneum	BRPO6	U	U	U	U	.	.	U	.
MSL	.	.	.	6262	paper mulberry	Broussonetia	papyrifera	BRPA4	U	P, U	U	U	.	P	U	.
MSL	.	.	.	6264	angels-trumpet	Brugmansia	candida	BRCA12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6266	Oriental mangrove	Bruguiera	gymnorhiza	BRGY3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6267	smallflower bruguiera	Bruguiera	parviflora	BRPA15	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6268	Oriental mangrove	Bruguiera	sexangula	BRSE11								
MSL	.	.	.	6270	West Indian sumac	Brunellia	comocladiifolia	BRCO6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6272	American brunfelsia	Brunfelsia	americana	BRAM4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6273	Serpentine Hill raintree	Brunfelsia	densifolia	BRDE4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6274	vega blanca	Brunfelsia	lactea	BRLA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6275	Puerto Rico raintree	Brunfelsia	portoricensis	BRPO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6277	omail	Buchanania	engleriana	BUEN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6278	gasu	Buchanania	merrillii	BUME4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6279	omail, deuachel	Buchanania	palawensis	BUPA16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6283	fourleaf buchenavia	Buchenavia	tetraphylla	BUTE4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6284	gregorywood	Bucida	buceras	BUBU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6294	cafe falso	Bunchosia	glandulifera	BUGL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6295	cafe forastero	Bunchosia	glandulosa	BUGL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6297	Bunchosia polystachia	Bunchosia	polystachia	BUPO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6299	Burckella richii	Burckella	richii	BURI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	854	gumbo limbo	Bursera	simaruba	BUSI	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	5328	South American jelly palm	Butia	capitata	BUCA15	.	.	.	.	.	.	.	.
MSL	.	.	.	6303	Buxus laevigata	Buxus	laevigata	BULA10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6306	Vahl's box	Buxus	vahlii	BUVA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6308	maricao cimun	Byrsonima	crassifolia	BYCR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6311	Long Key locustberry	Byrsonima	lucida	BYLU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6313	doncella	Byrsonima	spicata	BYSP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6315	almendrillo	Byrsonima	wadsworthii	BYWA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6317	divi divi	Caesalpinia	coriaria	CACO28	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6318	uhiuhi	Caesalpinia	kavaiensis	CAKA5	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6319	pride-of-Barbados	Caesalpinia	pulcherrima	CAPU13	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6320	sappanwood	Caesalpinia	sappan	CASA28	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6316	nicker	Caesalpinia	spp.	CAESA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6325	Surinamese stickpea	Calliandra	surinamensis	CASU33	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6326	caparosa	Callicarpa	ampla	CAAM14	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6328	crimson bottlebrush	Callistemon	citrinus	CACI15	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6329	weeping bottlebrush	Callistemon	viminalis	CAVI23	U	P, U	U	U	.	P	U	.
MSL	.	.	.	6338	Antilles calophyllum	Calophyllum	antillanum	CAAN22	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6341	Alexandrian laurel	Calophyllum	inophyllum	CAIN4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6342	tamanu	Calophyllum	neo-ebudicum	CANE31	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6343	chesemolech	Calophyllum	pelewense	CAPE15	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6344	olebtaches, chesemolech	Calophyllum	soulattri	CASO12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6346	roostertree	Calotropis	procera	CAPR	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6350	degame	Calycophyllum	candidissimum	CACA73	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6351	Kiaerskov's lidflower	Calyptranthes	kiaerskovii	CAKI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6352	limoncillo	Calyptranthes	krugii	CAKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6353	Luquillo forest lidflower	Calyptranthes	luquillensis	CALU12	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6354	pale lidflower	Calyptranthes	pallens	CAPA8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6355	Puerto Rico lidflower	Calyptranthes	portoricensis	CAPO9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6356	limoncillo de monte	Calyptranthes	sintenisii	CASI8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6358	Thomas' lidflower	Calyptranthes	thomasiana	CATH3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6359	myrtle of the river	Calyptranthes	zuzygium	CAZU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6360	Puerto Rico manac	Calyptronoma	rivalis	CARI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6366	kelela charm, kiu	Campnosperma	brevipetiolatum	CABR18	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6370	ilang-ilang	Cananga	odorata	CAOD	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6373	mesecheues	Canarium	hirsutum	CAHI14	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6374	lukerr	Canarium	indicum	CAIN42	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6372	mafoa	Canarium	mafoa	CAHA39	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6375	Pili Nut	Canarium	ovatum	CAOV7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6378	maali	Canarium	vitiense	CAVI26	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6379	Canarium vulgare	Canarium	vulgare	CAVU9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6380	wild cinnamon	Canella	winterana	CAWI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6383	burro blanco	Capparis	amplissima	CAAM13	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6384	caper	Capparis	baducca	CABA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6386	Jamaican caper	Capparis	cynophallophora	CACY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6387	falseteeth	Capparis	flexuosa	CAFL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6389	broadleaf caper	Capparis	hastata	CAHA9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6390	linguam	Capparis	indica	CAIN5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	5375	Siberian peashrub	Caragana	arborescens	CAAR18	U	U	U	U	.	.	U	.
MSL	.	.	.	6393	crabwood	Carapa	guianensis	CAGU6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6395	papaya	Carica	papaya	CAPA23	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6397	scorpionbush	Carmona	retusa	CARE22	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5378	European hornbeam	Carpinus	betulus	CABE8	U	U	U	U	.	.	U	.
MSL	.	.	.	391	American hornbeam, musclewood	Carpinus	caroliniana	CACA18	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	409	mockernut hickory	Carya	alba	CAAL27	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	401	water hickory	Carya	aquatica	CAAQ2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	413	southern shagbark hickory	Carya	carolinae-septentrionalis	CACA38	R, U	PNWS, U	R, U	R, U	.	.	.	P2

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MSL	.	.	.	402	bitternut hickory	Carya	cordiformis	CACO15	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	411	scrub hickory	Carya	floridana	CAFL6	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	403	pignut hickory	Carya	glabra	CAGL8	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	404	pecan	Carya	illinoinensis	CAIL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	405	shellbark hickory	Carya	laciniosa	CALA21	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	406	nutmeg hickory	Carya	myristiciformis	CAMY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	412	red hickory	Carya	ovalis	CAOV3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	407	shagbark hickory	Carya	ovata	CAOV2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	410	sand hickory	Carya	pallida	CAPA24	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	408	black hickory	Carya	texana	CATE9	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6399	fish tail palm	Caryota	mitis	CAMI36	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6401	fishtail palm	Caryota	urens	CAUR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6402	rabo de ranton	Casearia	aculeata	CAAC3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6403	gia verde	Casearia	arborea	CAAR8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6405	keuert	Casearia	cauliflora	CACA28	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6406	wild honeytree	Casearia	decandra	CADE11	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6407	Guyanese wild coffee	Casearia	guianensis	CAGU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6410	crackopen	Casearia	sylvestris	CASY2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6415	golden shower	Cassia	fistula	CAFI3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6417	pink shower	Cassia	grandis	CAGR11	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6418	apple blossom	Cassia	javanica	CAJA3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6419	gold medallion tree	Cassia	leptophylla	CALE49	U	U	U	U	.	.	U	.
MSL	.	.	.	6425	marbletree	Cassine	xylocarpa	CAXY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6427	goatwood	Cassipourea	guianensis	CAGU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	5401	Japanese chestnut	Castanea	crenata	CACR27	U	U	U	U	.	.	U	.
MSL	.	.	.	421	American chestnut	Castanea	dentata	CADE12	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	424	Chinese chestnut	Castanea	mollissima	CAMO83	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	422	Allegheny chinkapin	Castanea	pumila	CAPU9	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	423	Ozark chinkapin	Castanea	pumila var. ozarkensis	CAPUO	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	5402	European chestnut	Castanea	sativa	CASA27	U	U	U	U	.	.	U	.
MSL	.	.	.	6429	goatbush	Castela	erecta	CAER3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6430	Panama rubbertree	Castilla	elastica	CAEL5	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6433	river sheoak	Casuarina	cunninghamiana	CACU8	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6434	beach sheoak	Casuarina	equisetifolia	CAEQ	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	856	gray sheoak	Casuarina	glauca	CAGL11	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	857	belah	Casuarina	lepidophloia	CALE28	R, U	PNWS, U	R, U	R, C, U	C	.	.	P2
MSL	.	.	.	6437	gagu, australian pine	Casuarina	litorea	CALI8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	451	southern catalpa	Catalpa	bignonioides	CABI8	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6439	Haitian catalpa	Catalpa	longissima	CALO8	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	5411	Chinese catalpa	Catalpa	ovata	CAOV5	U	U	U	U	.	.	U	.
MSL	.	.	.	452	northern catalpa	Catalpa	speciosa	CASP8	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6441	trumpet tree	Cecropia	obtusifolia	CEOB	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6443	pumpwood	Cecropia	schreberiana	CESC9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6445	Spanish cedar	Cedrela	odorata	CEOD	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6447	pochote	Ceiba	acuminata	CEAC4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6448	pochote	Ceiba	aesculifolia	CEAE2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6449	kapoktree	Ceiba	pentandra	CEPE2	U	P, U	U	C, U	C	P	.	.
MSL	.	3	.	461	sugarberry	Celtis	laevigata	CELA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	462	hackberry	Celtis	occidentalis	CEOC	R, U	PNWS, U	R, U	R, U	.	.	.	P2

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	3	.	463	netleaf hackberry	Celtis	laevigata var. reticulata	CELAR	.	.	.	.	.	.	.	P2
MSL	.	.	.	6452	Celtis paniculata	Celtis	paniculata	CEPA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6458	Chinese hackberry	Celtis	sinensis	CESI8	U	U	U	U	.	.	U	.
MSL	.	.	.	6454	almex	Celtis	trinervia	CETR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6457	St. John's bread	Ceratonia	siliqua	CESI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6460	emeridech	Cerbera	floribunda	CEFL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6461	leva	Cerbera	manghas	CEMA20	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6462	chiute	Cerbera	odollam	CEOD2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5435	katsura tree	Cercidiphyllum	japonicum	CEJA2	U	U	U	U	.	.	U	.
MSL	.	.	.	471	eastern redbud	Cercis	canadensis	CECA4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	5,6	w	475	curlleaf mountain-mahogany	Cercocarpus	ledifolius	CELE3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	6468	lady of the night cactus	Cereus	hexagonus	CEHE3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6469	Cereus hildmannianus	Cereus	hildmannianus	CEHI3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6472	biut	Ceriops	tagal	CETA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6473	orange jessamine	Cestrum	aurantiacum	CEAU2	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	6474	day jessamine	Cestrum	diurnum	CEDI6	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6475	galen del monte	Cestrum	laurifolium	CELA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6477	night jessamine	Cestrum	nocturnum	CENO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6480	European fan palm	Chamaerops	humilis	CHHU7	U	U	U	U	.	.	U	.
MSL	.	.	.	6481	jointed sandmat	Chamaesyce	articulata	CHAR8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6482	koko	Chamaesyce	atrococca	CHAT2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6483	ekoko	Chamaesyce	celastroides	CHCE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6492	Herbsts sandmat	Chamaesyce	herbstii	CHHE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6493	kokomalei	Chamaesyce	kuwaleana	CHKU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6494	alpine sandmat	Chamaesyce	olowaluana	CHOL3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6495	Koolau Range sandmat	Chamaesyce	rockii	CHRO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6497	Napali coast papala	Charpentiera	densiflora	CHDE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6498	ellipticleaf papala	Charpentiera	elliptica	CHEL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6499	broadleaf papala	Charpentiera	obovata	CHOB2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6500	Koolau Range papala	Charpentiera	ovata	CHOV2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6504	Waianae Range papala	Charpentiera	tomentosa	CHTO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6507	Domins club	Cheirodendron	dominii	CHDO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6508	Fauries club	Cheirodendron	fauriei	CHFA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6509	olapa	Cheirodendron	forbesii	CHFO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6510	lapalapa	Cheirodendron	platyphyllum	CHPL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6514	olapalapa	Cheirodendron	trigynum	CHTR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6517	alaweo	Chenopodium	oahuense	CHOA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6519	hueso	Chionanthus	axilliflorus	CHAX2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6520	bridgotree	Chionanthus	compactus	CHCO12	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6521	white rosewood	Chionanthus	domingensis	CHDO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6522	hueso prieto	Chionanthus	holdridgei	CHHO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6523	cabra blanca	Chionanthus	ligustrinus	CHLI6	U	U	U	C, U	C	.	.	.
MSL	.	8	.	6524	Chinese fringetree	Chionanthus	retusus	CHRE9	.	U	U	U	.	.	U	.
MSL	.	.	.	6525	vitiensis	Chionanthus	vitiensis	CHVI22	U	P, U	U	U	.	P	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6526	puntaj jayuya	Chione	seminervis	CHSE5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6528	fatpork	Chione	venosa	CHVE4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6529	african teak	Chlorophora	excelsa	CHEX5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6532	silk-floss tree	Chorisia	speciosa	CHSP13	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	6535	icaco coco plum	Chrysobalanus	icaco	CHIC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	431	giant chinkapin, golden chinkapin	Chrysolepis	chrysophylla var. chrysophylla	CHCHC4	R, U	PNWS, U	U	U	.	.	.	P2
MSL	.	.	.	6539	bastard redwood	Chrysophyllum	argenteum	CHAR6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6541	star apple	Chrysophyllum	cainito	CHCA10	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6542	satinleaf	Chrysophyllum	oliviforme	CHOL	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6543	camito de perro	Chrysophyllum	pauciflorum	CHPA31	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6546	Chamissos manfern	Cibotium	chamissoi	CICH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6547	hapuu	Cibotium	glaucum	CIGL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6545	Hawaiian tree fern	Cibotium	heleniae	CIHE7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6548	hapuu li	Cibotium	menziesii	CIME8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6549	manfern	Cibotium	spp.	CIBOT	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6552	quinine	Cinchona	pubescens	CIPU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6554	cassia	Cinnamomum	aromaticum	CIAR8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6555	Padang cassia	Cinnamomum	burmannii	CIBU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	858	camphortree	Cinnamomum	camphora	CICA	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	6557	ochod	Cinnamomum	carolinense	CICA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6559	laurel avispillo	Cinnamomum	elongatum	CIEL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6560	avispillo	Cinnamomum	montanum	CIMO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6561	ochod	Cinnamomum	pedatinervium	CIPE6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6562	matieu	Cinnamomum	sessilifolium	CISE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6564	cinnamon	Cinnamomum	verum	CIVE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6565	juniper berry	Citharexylum	caudatum	CICA8	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6567	spiny fiddlewood	Citharexylum	spinosum	CISP3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6570	samoensis	Citronella	samoensis	CISA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6572	Lime (Tipolo)	Citrus	aurantifolia	CIAU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6579	limon china	Citrus	hystrix	CIHY2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6580	kahet, wild orange	Citrus	macroptera	CIMA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6581	Citrus maxima	Citrus	maxima	CIMA5	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6582	Citrus medica	Citrus	medica	CIME3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6583	calamondin, kingkang	Citrus	mitis	CIMI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6584	Citrus reticulata	Citrus	reticulata	CIRE3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	860	citrus spp.	Citrus	spp.	CITRU2	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	6573	key lime	Citrus	x aurantiifolia	CIAU7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6574	sour orange	Citrus	x aurantium	CIAU8	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6575	lemon	Citrus	x limon	CILI5	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6576	grapefruit	Citrus	x paradisi	CIPA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6577	sweet orange	Citrus	x sinensis	CISI3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	481	yellowwood	Cladrastis	kentukea	CLKE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6586	koee	Claoxylon	carolinianum	CLCA15	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6588	Claoxylon fallax	Claoxylon	fallax	CLFA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6589	Claoxylon longiracemosum	Claoxylon	longiracemosum	CLLO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6590	katteknau, katot	Claoxylon	marianum	CLMA25	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6591	poola	Claoxylon	sandwicense	CLSA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6593	Cleistanthus carolinianus	Cleistanthus	carolinianus	CLCA18	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6594	Cleistanthus insularis	Cleistanthus	insularis	CLIN8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6597	oha wai nui	Clermontia	arborescens	CLAR4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6601	Kauai clermontia	Clermontia	clermontioides	CLCL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6604	Kohala Mountain clermontia	Clermontia	drepanomorpha	CLDR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6605	haha aiakamanu	Clermontia	fauriei	CLFA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6606	bog clermontia	Clermontia	grandiflora	CLGR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6610	oha kepau	Clermontia	hawaiiensis	CLHA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6611	forest clermontia	Clermontia	kakeana	CLKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6612	Waipio Valley clermontia	Clermontia	kohalae	CLKO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6596	oha wai nui Clermontia	Clermontia	x leptoclada	CLLE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6613	hillside clermontia	Clermontia	lindseyana	CLLI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6614	Maui clermontia	Clermontia	micrantha	CLMI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6615	Mauna Loa clermontia	Clermontia	montis-loa	CLMO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6616	Oahu clermontia	Clermontia	oblongifolia	CLOB2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6620	Wailai Pali clermontia	Clermontia	pallida	CLPA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6621	smallflower clermontia	Clermontia	parviflora	CLPA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6622	pele clermontia	Clermontia	peleana	CLPE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6625	Waioiani clermontia	Clermontia	persicifolia	CLPE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6626	Hamakua clermontia	Clermontia	pyrularia	CLPY2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6627	Clermontia singuliflora	Clermontia	singuliflora	CLSI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6628	clermontia	Clermontia	spp.	CLERM	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6629	Haleakala clermontia	Clermontia	tuberculata	CLTU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6630	swampforest clermontia	Clermontia	waimeae	CLWA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6631	haggarbush	Clerodendrum	aculeatum	CLAC2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	5523	rose glorybower	Clerodendrum	bungei	CLBU	U	U	U	U	.	.	U	.
MSL	.	.	.	6633	Natal glorybower	Clerodendrum	glabrum	CLGL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6635	velvetleaf glorybower	Clerodendrum	macrostegium	CLMA24	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6636	glorybower	Clerodendrum	spp.	CLERO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6637	teta prieta	Cleyera	albopunctata	CLAL4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6639	jackass breadnut	Clibadium	erosum	CLER	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6641	Clidemia cymosa	Clidemia	cymosa	CLCY5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6645	kiniyaw, ochop	Clinostigma	carolinense	CLCA21	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6644	Philippine pigeonwings	Clitoria	fairchildiana	CLFA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6646	cupeillo	Clusia	clusioides	CLCL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6648	Grundlach's attorney	Clusia	gundlachii	CLGU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6650	cupey de monte	Clusia	minor	CLMI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6651	Scotch attorney	Clusia	rosea	CLRO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6655	treadsoftly	Cnidoscolus	aconitifolius	CNAC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6658	uvilla	Coccoloba	costata	COCO8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	863	tietongue, pigeon-plum	Coccoloba	diversifolia	CODI8	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	6660	whitewood	Coccoloba	krugii	COKR	U	U	U	C, U	C	.	.	.

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MSL	.	.	.	6661	puckhout	Coccoloba	microstachya	COMI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6662	pale seagrape	Coccoloba	pallida	COPA24	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6663	grandleaf seagrape	Coccoloba	pubescens	COPU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6664	uvera	Coccoloba	pyrifolia	COPY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6665	ortegon	Coccoloba	rugosa	CORU4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6666	uvero de monte	Coccoloba	sintenisii	COSI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6668	Swartz's pigeonplum	Coccoloba	swartzii	COSW	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6669	Bahama pigeonplum	Coccoloba	tenuifolia	COTE9	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	6670	seagrape	Coccoloba	uvifera	COUV	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6671	false chiggergrape	Coccoloba	venosa	COVE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	907	Florida silver palm	Coccothrinax	argentata	COAR	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	6673	Coccothrinax barbadensis	Coccothrinax	barbadensis	COBA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6679	silk cottontree	Cochlospermum	vitifolium	COVI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	908	coconut palm	Cocos	nucifera	CONU	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	6683	garden croton	Codiaeum	variegatum	COVA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6684	Arabian coffee	Coffea	arabica	COAR2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6686	Coffea liberica	Coffea	liberica	COLI8	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6685	robusta coffee	Coffea	robusta	CORO8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6688	Cojoba arborea	Cojoba	arborea	COAR9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6689	abata cola	Cola	acuminata	COAC4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6691	uab, chuchab	Colona	scabra	COSC13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6693	common snakebark	Colubrina	arborescens	COAR3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	864	soldierwood	Colubrina	elliptica	COEL2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	6697	kauila	Colubrina	oppositifolia	COOP	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5559	bladder senna	Colutea	arborescens	COAR6	U	U	U	U	.	.	U	.
MSL	.	.	.	6703	Mao	Commersonia	bartramia	COBA17	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6705	poison ash	Comocladia	dodonaea	CODO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6706	carrasco	Comocladia	glabra	COGL4	U	U	U	C, U	C	.	.	.
MSL	.	.	w	867	Bluewood	Condalia	hookeri	COHO	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	987	buttonwood-mangrove	Conocarpus	erectus	COER2	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	6710	Luquillo Mountain snailwood	Conostegia	rufescens	CORU17	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6711	Consolea moniliformis	Consolea	moniliformis	COMO8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6712	Consolea rubescens	Consolea	rubescens	CORU8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6714	copaiba	Copaifera	officinalis	COOF2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6716	forest mirrorplant	Coprosma	foliosa	COFO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6717	koi	Coprosma	kauensis	COKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6718	Oahu mirrorplant	Coprosma	longifolia	COLO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6719	alpine mirrorplant	Coprosma	montana	COMO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6720	Maui mirrorplant	Coprosma	ochracea	COOC3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6721	pubescent mirrorplant	Coprosma	pubens	COPU8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6722	woodland mirrorplant	Coprosma	rhynchocarpa	CORH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6724	mirrorplant	Coprosma	spp.	COPRO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6726	olena	Coprosma	waimeae	COWA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6728	Spanish elm	Cordia	alliodora	COAL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6729	Tou	Cordia	aspera	COAS6	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8651	Anacahuita Texas Olive	Cordia	boissieri	COBO2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	6730	muneco	Cordia	borinquensis	COBO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6731	red manjack	Cordia	collococca	COCO5	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6733	fragrant manjack	Cordia	dichotoma	CODI18	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6735	smooth manjack	Cordia	laevigata	COLA12	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6736	Cordia micronesica	Cordia	micronesica	COMI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6737	clammy cherry	Cordia	obliqua	COOB3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6738	San Bartolome	Cordia	rickseckeri	CORI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	865	largeleaf geigertree	Cordia	sebestena	COSE2	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	6742	kou	Cordia	subcordata	COSU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6743	mucilage manjack	Cordia	sulcata	COSU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6744	tiplant	Cordyline	fruticosa	COFR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	491	flowering dogwood	Cornus	florida	COFL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5591	kousa dogwood	Cornus	kousa	COKO2	U	U	U	U	.	.	U	.
MSL	.	.	.	492	Pacific dogwood	Cornus	nuttallii	CONU4	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	6746	nigua	Cornutia	obovata	COOB4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6747	azulejo	Cornutia	pyramidata	COPY2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	5600	Turkish hazelnut	Corylus	colurna	COCO30	U	U	U	U	.	.	U	.
MSL	.	.	.	6749	redgum	Corymbia	calophylla	COCA48	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6750	Corymbia citriodora	Corymbia	citriodora	COCI4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6751	redflower gum	Corymbia	ficifolia	COFI7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6752	red bloodwood	Corymbia	gummifera	COGU4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6754	karaka nut	Corynocarpus	laevigatus	COLA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5603	European smoketree	Cotinus	coggygria	COCO10	U	U	U	U	.	.	U	.
MSL	.	.	.	996	smoketree	Cotinus	obovatus	COOB2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6756	cannonball tree	Couroupita	guianensis	COGU3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	503	Brainerd's hawthorn	Crataegus	brainerdii	CRBR3	.	U	U	U	.	.	.	P2
MSL	.	.	.	504	pear hawthorn	Crataegus	calpodendron	CRCA	.	U	U	U	.	.	.	P2
MSL	.	.	.	505	fireberry hawthorn	Crataegus	chrysocarpa	CRCH	.	U	U	U	.	.	.	P2
MSL	.	.	.	501	cockspur hawthorn	Crataegus	crus-galli	CRCR2	.	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	506	broadleaf hawthorn	Crataegus	dilatata	CRDI	.	U	U	U	.	.	.	P2
MSL	.	.	.	507	fanleaf hawthorn	Crataegus	flabellata	CRFL	.	U	U	U	.	.	.	P2
MSL	.	.	.	502	downy hawthorn	Crataegus	mollis	CRMO2	.	PNWS, U	U	R, U	.	.	.	P2
MSL	.	4,5,6	.	508	oneseed hawthorn	Crataegus	monogyna	CRMO3	.	U	U	U	.	.	.	P2
MSL	.	.	.	509	scarlet hawthorn	Crataegus	pedicellata	CRPE	.	U	U	U	.	.	.	P2
MSL	.	3,4,5,6,10	.	500	hawthorn spp.	Crataegus	spp.	CRATA	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	5092	fleshy hawthorn	Crataegus	succulenta	CRSU5	.	U	U	U	.	.	.	P2
MSL	.	.	.	5093	dwarf hawthorn	Crataegus	uniflora	CRUN	.	U	U	U	.	.	.	P2
MSL	.	.	.	6758	sacred garlic pear	Crateva	religiosa	CRRE12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6760	houka, calabash	Crescentia	alata	CRAL11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6761	common calabash tree	Crescentia	cujete	CRCU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6762	higuerito	Crescentia	linearifolia	CRLI5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6763	higuero de sierra	Crescentia	portoricensis	CRPO6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6765	Critonia portoricensis	Critonia	portoricensis	CRPO7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6767	maidenberry	Crossopetalum	rhacoma	CRRH	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6769	Saitamu	Crossostylis	biflora	CRBI9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6771	longbeak rattlebox	Crotalaria	longirostrata	CRLO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6773	wild marrow	Croton	astroites	CRAS3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6774	Croton flavens	Croton	flavens	CRFL23	U	U	U	C, U	C	.	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6775	sabinon	Croton	poecilanthus	CRPO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6779	laulilii	Cryptocarya	elegans	CREL8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6781	holio	Cryptocarya	mannii	CRMA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6778	Cryptocarya oreophila	Cryptocarya	oreophila	CROR5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6784	laulilii	Cryptocarya	turbinata	CRTU4	U	P, U	U	U	.	P	.	.
MSL	.	8	.	5776	storehousebush	Cudrania	tricuspidata	CUTR2	U	U	U	U	.	.	U	.
MSL	.	.	.	6790	wild ackee	Cupania	americana	CUAM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6792	guara blanca	Cupania	triquetra	CUTR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	866	carrotwood	Cupaniopsis	anacardioides	CUAN4	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	6800	Haleakala cyanea	Cyanea	aculeatiflora	CYAC4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6801	palmtree cyanea	Cyanea	arborea	CYAR10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6802	Kauai cyanea	Cyanea	fissa	CYFI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6805	Degeners cyanea	Cyanea	floribunda	CYFL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6806	Kilauea Mauna cyanea	Cyanea	giffardii	CYGI5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6807	wetforest cyanea	Cyanea	hamatiflora	CYHA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6810	Oahu cyanea	Cyanea	hardyi	CYHA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6811	prickly cyanea	Cyanea	horrida	CYHO6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6812	Limahuli Valley cyanea	Cyanea	kuhihewa	CYKU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6813	Kunths cyanea	Cyanea	kunthiana	CYKU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6814	giant kokee cyanea	Cyanea	leptostegia	CYLE5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6815	purple cyanea	Cyanea	macrostegia	CYMA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6818	Marks cyanea	Cyanea	marksii	CYMA14	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6819	hairy cyanea	Cyanea	pilosa	CYPI4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6822	pohaku cyanea	Cyanea	pohaku	CYPO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6823	Molokai cyanea	Cyanea	procera	CYPR8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6824	manyfruit cyanea	Cyanea	pycnocarpa	CYPY	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6825	oakleaf cyanea	Cyanea	quercifolia	CYQU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6826	plateau delissea	Cyanea	rivularis	CYRI4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6827	pua kala	Cyanea	solenocalyx	CYSO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6828	cyanea	Cyanea	spp.	CYANE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6829	Kaiholena cyanea	Cyanea	stictophylla	CYST5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6830	Mt. Kaala cyanea	Cyanea	superba	CYSU8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6833	aku aku	Cyanea	tritomantha	CYTR6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6834	parrotfeather treefern	Cyathea	andina	CYAN	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6835	West Indian treefern	Cyathea	arborea	CYAR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6837	Coopers cyathea	Cyathea	cooperi	CYCO18	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6838	olioli	Cyathea	decurrens	CYDE16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6839	Jamaican treefern	Cyathea	furfuracea	CYFU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6840	olioli	Cyathea	lunulata	CYLU5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6841	olioli	Cyathea	medullaris	CYME12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6842	kattar	Cyathea	nigricans	CYNI7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6843	small treefern	Cyathea	parvula	CYPA7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6844	kattar	Cyathea	ponapeana	CYPO11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6848	helecho gigante	Cyathea	tenera	CYTE10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6849	olioli	Cyathea	truncata	CYTR11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6850	Cybianthus sintenisii	Cybianthus	sintenisii	CYSI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6852	queen sago	Cycas	circinalis	CYCI3	U	P, U	U	C, U	C	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6856	Micronesian cycad, fadang	Cycas	micronesica	CYMI8	.	.	.	.	.	P	.	.
MSL	.	.	.	6853	remiang	Cycas	revoluta	CYRE11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6855	ola	Cyclophyllum	barbatum	CYBA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	5818	quince	Cydonia	oblonga	CYOB2	U	U	U	U	.	.	U	.
MSL	.	.	.	6857	oreganillo falso	Cynometra	portoricensis	CYPO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6858	gulos	Cynometra	ramiflora	CYRA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6859	eeme, aapwo	Cynometra	yokotae	CYYO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6860	tree-tomato	Cyphomandra	betacea	CYBE3	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	6862	swamp titi	Cyrilla	racemiflora	CYRA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6865	forest cyrtandra	Cyrtandra	giffardii	CYGI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6864	Cyrtandra	Cyrtandra	ramosissima	CYRA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6867	candletree	Dacryodes	excelsa	DAEX	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6868	cocobolo	Dalbergia	retusa	DARE6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6869	Indian rosewood	Dalbergia	sissoo	DASI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6870	cocobolo	Dalbergia	tucurensis	DATU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6871	burn nose	Daphnopsis	americana	DAAM2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6872	Heller's cieneguillo	Daphnopsis	helleriana	DAHE2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6873	emajagua de sierra	Daphnopsis	philippiana	DAPH	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6875	Hawaii delissea	Delissea	fallax	DEFA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6876	cutleaf delissea	Delissea	laciniata	DELA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6877	Niihau delissea	Delissea	niihauensis	DENI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6880	smallflower delissea	Delissea	parviflora	DEPA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6881	delissea	Delissea	spp.	DELIS	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6882	leechleaf delissea	Delissea	undulata	DEUN2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6883	royal poinciana	Delonix	regia	DERE	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6885	salato	Dendrocnide	harveyi	DEHA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6886	kahtat	Dendrocnide	latifolia	DELA13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6888	angelica tree	Dendropanax	arboreus	DEAR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6889	palo de vaca	Dendropanax	laurifolius	DELA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6891	redpalm	Dictyosperma	album	DIAL13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6896	chulta	Dillenia	indica	DIIN6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6898	shrubby dillenia	Dillenia	suffruticosa	DISU11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6899	Dimocarpus longan	Dimocarpus	longan	DILO7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6900	mabolo	Diospyros	blancoi	DIBL3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6902	Mabolo	Diospyros	discolor	DIDI9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6904	anume	Diospyros	elliptica	DIEL3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6905	Diospyros ferrea	Diospyros	ferrea	DIFE5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6906	elama	Diospyros	hillebrandii	DIHI4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6907	persimmon	Diospyros	kaki	DIKA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6909	black apple	Diospyros	revoluta	DIRE6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6910	auauli	Diospyros	samoensis	DISA16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6911	lama	Diospyros	sandwicensis	DISA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6912	Chinese persimmon	Diospyros	sintenisii	DISI3	U	U	U	C, U	C	.	.	.
MSL	.	.	w	522	Texas persimmon	Diospyros	texana	DITE3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	521	common persimmon	Diospyros	virginiana	DIVI5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6921	otot	Discocalyx	ponapensis	DIPO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6923	jaboncillo	Ditta	myricoides	DIMY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6927	Florida hopbush	Dodonaea	viscosa	DOVI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6928	rru	Dolichandrone	spathacea	DOSP3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6930	Ceylon gooseberry	Dovyalis	hebecarpa	DOHE2	U	P, U	U	C, U	C	P	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6932	fragrant dracaena	Dracaena	fragrans	DRFR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6933	Dracaena multiflora	Dracaena	multiflora	DRMU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6934	song of India	Dracaena	reflexa	DRRE6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6937	cafeillo	Drypetes	alba	DRAL5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6935	Drypetes carolinensis	Drypetes	carolinensis	DRCA18	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6936	Drypetes dolichocarpa	Drypetes	dolichocarpa	DRDO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6938	varital	Drypetes	glauca	DRGL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6939	rosewood	Drypetes	ilicifolia	DRIL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6940	guiana plum	Drypetes	lateriflora	DRLA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6941	kevert	Drypetes	nitida	DRNI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6943	.	Drypetes	vitiensis	DRVI5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6949	Drypetes yapensis	Drypetes	yapensis	DRYA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6947	Mauna Kea dubautia	Dubautia	arborea	DUAR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6944	Dubautia	Dubautia	demissifolia	DUDE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6945	Dubautia	Dubautia	x fallax	DUFA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6948	forest dubautia	Dubautia	knudsenii	DUKN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6952	Kauai dubautia	Dubautia	microcephala	DUMI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6946	Dubautia	Dubautia	montana	DUMO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6953	plantainleaf dubautia	Dubautia	plantaginea	DUPL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6957	netvein dubautia	Dubautia	reticulata	DURE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6958	dubautia	Dubautia	spp.	DUBAU	U	P, U	U	U	.	P	.	.
MSL	.	3	.	6961	golden dewdrops	Duranta	erecta	DUER	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6965	Durian	Durio	zibethinus	DUZI	U	P, U	U	U	.	P	.	.
MSL	.	.	w	6966	yellow butterfly palm	Dypsis	lutescens	DYLU	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	6968	maota mea	Dysoxylum	huntii	DYHU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6969	maota	Dysoxylum	maota	DYMA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6972	Dysoxylum mollissimum ssp. Molle	Dysoxylum	mollissimum	DYMOM	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6970	mamala	Dysoxylum	samoense	DYSA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	868	Blackbead ebony	Ebenopsis	ebano	EBEB	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	w	523	Anacua knockaway	Ehretia	anacua	EHAN	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	997	Russian-olive	Elaeagnus	angustifolia	ELAN	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6973	oil nut palm	Elaeis	guineensis	ELGU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6975	kalia	Elaeocarpus	bifidus	ELBI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6976	syatak	Elaeocarpus	carolinensis	ELCA20	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6977	\`a\`mati\`e	Elaeocarpus	floridanus	ELFL6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6978	Elaeocarpus graeffei	Elaeocarpus	graeffei	ELGR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6979	sapatua	Elaeocarpus	grandis	ELGR6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6980	joga	Elaeocarpus	joga	ELJO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6981	Elaeocarpus kerstingianus	Elaeocarpus	kerstingianus	ELKE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6974	Kosrae elaeocarpus	Elaeocarpus	kusaiensis	ELKU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6982	maratte, opop	Elaeocarpus	kusanoi	ELKU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6984	aamatie	Elaeocarpus	tonganus	ELTO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6985	Elaeocarpus	Elaeocarpus	ulianus	ELUL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6990	taputoi	Elattostachys	falcata	ELFA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6994	elaeocarpa	Endiandra	elaeocarpa	ENEL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6996	monkeysoap	Enterolobium	cyclocarpum	ENCY	U	P, U	U	C, U	C	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	6997	bronze loquat	Eriobotrya	deflexa	ERDE16	U	U	U	U	.	.	U	.
MSL	.	.	.	6998	loquat	Eriobotrya	japonica	ERJA3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7000	blacktorch	Erithalis	fruticosa	ERFR4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7004	machete	Erythrina	berteriana	ERBE3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7005	coral erythrina	Erythrina	corallodendron	ERCO22	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7003	naked coral tree	Erythrina	coralloides	ERCO	U	U	U	U	.	.	U	.
MSL	.	.	.	7006	crybabytree	Erythrina	crista-galli	ERCR6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7007	cock's spur	Erythrina	eggersii	EREG	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7008	bucayo	Erythrina	fusca	ERFU2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7011	mountain immortelle	Erythrina	poeppigiana	ERPO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7012	wili wili	Erythrina	sandwicensis	ERSA11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7014	gatae palagi	Erythrina	subumbrans	ERSU15	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7015	tiger's claw	Erythrina	variegata	ERVA7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7016	tiger's claw	Erythrina	variegata var. orientalis	ERVAO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7017	acuminatissimum	Erythrospermum	acuminatissimum	ERAC10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7019	swamp-redwood	Erythroxylum	areolatum	ERAR17	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7021	ratwood	Erythroxylum	rotundifolium	ERRO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7022	rufous false cocaine	Erythroxylum	rufum	ERRU4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7024	Urban's false cocaine	Erythroxylum	urbanii	ERUR4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7025	southern mahogany	Eucalyptus	botryoides	EUBO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7026	applebox	Eucalyptus	bridgesiana	EUBR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	512	river redgum	Eucalyptus	camaldulensis	EUCA2	R, U	PNWS, P, U	R, U	U	.	P	.	P2
MSL	.	.	.	7028	argyle apple	Eucalyptus	cinerea	EUCI80	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7030	sugargum	Eucalyptus	cladocalyx	EUCL	U	P, U	U	U	.	P	U	.
MSL	.	.	.	7035	silver-dollar eucalyptus	Eucalyptus	cordata	EUCO31	U	U	U	U	.	.	U	.
MSL	.	.	.	7031	yate	Eucalyptus	cornuta	EUCO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7032	narrowleaf red ironbark	Eucalyptus	crebra	EUCR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7033	roundleaf gum	Eucalyptus	deanei	EUDE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7034	Indonesian gum	Eucalyptus	deglupta	EUDE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	511	Tasmanian bluegum	Eucalyptus	globulus	EUGL	R, U	PNWS, P, U	R, U	U	.	P	.	P2
MSL	.	.	.	7038	tuart	Eucalyptus	gomphocephala	EUGO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7039	mountain graygum	Eucalyptus	goniocalyx	EUGO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	513	grand eucalyptus	Eucalyptus	grandis	EUGR12	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	7041	white box	Eucalyptus	hemiphloia	EUHE12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7036	white ironbark	Eucalyptus	leucoxylon	EULE13	U	U	U	U	.	.	U	.
MSL	.	.	.	7043	spotted gum	Eucalyptus	maculata	EUMA23	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7044	jarrah	Eucalyptus	marginata	EUMA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7045	Australian tallowwood	Eucalyptus	microcorys	EUMI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7046	gray ironbark	Eucalyptus	paniculata	EUPA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7047	blackbutt	Eucalyptus	pilularis	EUPI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7040	redbox	Eucalyptus	polyanthemos	EUPO	U	U	U	U	.	.	U	.
MSL	.	.	.	7048	black ironbox	Eucalyptus	raveretiana	EURA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7049	redmahogany	Eucalyptus	resinifera	EURE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	514	swampmahogany	Eucalyptus	robusta	EURO2	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	7051	Western Australian floodedgum	Eucalyptus	rudis	EURU2	U	P, U	U	U	.	P	U	.
MSL	.	.	.	7052	black peppermint	Eucalyptus	salicifolia	EUSA17	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7053	Sydney bluegum	Eucalyptus	saligna	EUSA	U	P, U	U	C, U	C	P	.	.

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MSL	.	.	.	7054	red ironbark	Eucalyptus	sideroxylon	EUSI2	U	P, U	U	U	.	P	U	.
MSL	.	5,6,10	.	510	eucalyptus spp.	Eucalyptus	spp.	EUCAL	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	7056	forest redgum	Eucalyptus	tereticornis	EUTE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7057	manna gum	Eucalyptus	viminalis	EUVI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7060	white stopper	Eugenia	axillaris	EUAX	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7061	blackrodwood	Eugenia	biflora	EUBI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7062	Sierra de Cayey stopper	Eugenia	boqueronensis	EUBO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7063	guayabota de sierra	Eugenia	borinquensis	EUBO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7065	cloves	Eugenia	caryophyllus	EUCA16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7066	redberry stopper	Eugenia	confusa	EUCO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7067	lathberry	Eugenia	cordata	EUCO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7068	lathberry	Eugenia	cordata var. sintenisii	EUCOS	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7069	sperry guava	Eugenia	corozalensis	EUCO13	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7071	serrette guave	Eugenia	domingensis	EUDO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7072	guasabara	Eugenia	eggersii	EUEG	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7075	smooth rodwood	Eugenia	glabrata	EUGL6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7076	Luquillo Mountain stopper	Eugenia	haematocarpa	EUHA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7079	nioi	Eugenia	koolauensis	EUKO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7081	privet stopper	Eugenia	ligustrina	EULI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7084	birdcherry	Eugenia	monticola	EUMO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7086	Eugenia nitida	Eugenia	nitida	EUNI2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7087	orenged	Eugenia	palauensis	EUPA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7088	agatelang	Eugenia	palumbis	EUPA28	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7089	rockmyrtle	Eugenia	procera	EUPR4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7090	Christmas cherry	Eugenia	pseudopsidium	EUPS	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7091	mountain stopper	Eugenia	reinwardtiana	EURE7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	873	red stopper	Eugenia	rhombea	EURH	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7093	serrasuela	Eugenia	serrasuela	EUSE9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7094	sessileleaf stopper	Eugenia	sessiliflora	EUSE10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7096	stopper	Eugenia	spp.	EUGEN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7098	Stahl's stopper	Eugenia	stahlii	EUST3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7100	Stewardson's stopper	Eugenia	stewardsonii	EUST6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7101	rebotel	Eugenia	suzukii	EUSU9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7102	atoto	Eugenia	thompsonii	EUTH4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7103	Underwood's stopper	Eugenia	underwoodii	EUUN	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	7104	Surinam cherry	Eugenia	uniflora	EUUN2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7105	aridland stopper	Eugenia	xerophytica	EUXE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7123	Euodia hortensis	Euodia	hortensis	EUHO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7124	kertub	Euodia	nitida	EUNI8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7125	beror	Euodia	palawensis	EUPA29	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7126	Euodia ponapensis	Euodia	ponapensis	EUPO15	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7128	Euodia trichantha	Euodia	trichantha	EUTR13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7109	Mexican shrubby spurge	Euphorbia	cotinifolia	EUCO24	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7110	Kauai spurge	Euphorbia	haeleeleana	EUHA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7111	mottled spurge	Euphorbia	lactea	EULA8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7112	Indian spurgetree	Euphorbia	neriifolia	EUNE4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7113	manchineel berry	Euphorbia	petiolaris	EUPE8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7114	poinsettia	Euphorbia	pulcherrima	EUPU9	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	7115	spurge	Euphorbia	spp.	EUPHO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7116	Indiantree spurge	Euphorbia	tirucalli	EUTI	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7119	anini	Eurya	sandwicensis	EUSA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7129	blinding tree	Excoecaria	agallocha	EXAG	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7131	hulumoa	Exocarpos	gaudichaudii	EXGA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7133	kotop	Exorrhiza	ponapensis	EXPO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7135	Caribbean princewood	Exostema	caribaeum	EXCA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7136	plateado	Exostema	ellipticum	EXEL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7137	Exostema sanctae-luciae	Exostema	sanctae-luciae	EXSA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	874	butterbough, inkwood	Exothea	paniculata	EXPA	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7141	pualulu	Fagraea	berteroana	FABE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7142	ksid	Fagraea	ksid	FAKS	U	P, U	U	U	.	P	.	.
MSL	.	.	.	531	American beech	Fagus	grandifolia	FAGR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5983	European beech	Fagus	sylvatica	FASY	U	U	U	U	.	.	U	.
MSL	.	.	.	7144	peacocksplume	Falcataria	moluccana	FAMO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7146	false coffee	Faramea	occidentalis	FAOC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7147	feijoa	Feijoa	sellowiana	FESE2	U	U	U	U	.	.	U	.
MSL	.	.	.	7148	Jamaican cherry fig	Ficus	americana	FIAM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	876	Florida strangler fig	Ficus	aurea	FIAU	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	7153	Roxburgh fig	Ficus	auriculata	FIAU3	U	U	U	U	.	.	U	.
MSL	.	.	.	7149	Indian banyan	Ficus	benghalensis	FIBE2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7150	weeping fig	Ficus	benjamina	FIBE	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7151	edible fig	Ficus	carica	FICA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	877	wild banyantree, shortleaf fig	Ficus	citrifolia	FICI	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7152	Ficus copiosa	Ficus	copiosa	FICO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7154	brown-woolly fig	Ficus	drupacea	FIDR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7155	Indian rubberplant	Ficus	elastica	FIEL	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7156	mati	Ficus	godeffroyi	FIGO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7158	Ficus lutea	Ficus	lutea	FILU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7159	fiddleleaf fig	Ficus	lyrata	FILY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7160	Chinese banyan	Ficus	microcarpa	FIMI2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7162	tibig	Ficus	nota	FINO3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7163	aoa	Ficus	obliqua	FIOB3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7164	amate	Ficus	obtusifolia	FIOB	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7165	aoa	Ficus	prolixa	FIPR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7166	peepul tree	Ficus	religiosa	FIRE3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7167	Port Jackson fig	Ficus	rubiginosa	FIRU4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7168	lulk, banyan	Ficus	saffordii	FISA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7169	mati vao	Ficus	scabra	FISC3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7171	fig	Ficus	spp.	FICUS	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7173	jaguey	Ficus	stahlii	FIST	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7174	sycamore fig	Ficus	sycomorus	FISY2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7175	Chinese banyan	Ficus	thonningii	FITH2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7176	mati	Ficus	tinctoria	FITI2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7177	jaguey blanco	Ficus	trigonata	FITR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7178	mati	Ficus	uniauriculata	FIUN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7179	higo	Ficus	virens	FIVI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6068	Japanese fern tree	Filicium	decipiens	FIDE2	U	P, U	U	U	.	P	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7180	Finschia chloroxantha	Finschia	chloroxantha	FICH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7181	Chinese parasoltree	Firmiana	simplex	FISI2	U	U	U	U	.	.	U	.
MSL	.	.	.	7182	burr daisytree	Fitchia	speciosa	FISP3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7184	governor's plum	Flacourtia	indica	FLIN	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7185	batoko plum	Flacourtia	inermis	FLIN3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7186	filimoto	Flacourtia	rukam	FLRU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7188	Queensland maple	Flindersia	brayleyana	FLBR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7190	Flueggea acidoton	Flueggea	acidoton	FLAC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7191	poumuli	Flueggea	flexuosa	FLFL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7192	mehamehame	Flueggea	neowawraea	FLNE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7194	inkbush	Forestiera	eggersiana	FOEG	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7195	caca ravet	Forestiera	rhamnifolia	FORH	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	7196	Florida swampprivet	Forestiera	segregata	FOSE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7198	oval kumquat	Fortunella	margarita	FOMA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7202	West Indian buckthorn	Frangula	sphaerosperma	FRSPL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7203	Franklin tree	Franklinia	alatamaha	FRAL	U	U	U	U	.	.	U	.
MSL	.	.	.	541	white ash	Fraxinus	americana	FRAM2	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
MSL	.	.	.	5491	Berlandier ash	Fraxinus	berlandieriana	FRBE	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	548	Carolina ash	Fraxinus	caroliniana	FRCA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5492	European ash	Fraxinus	excelsior	FREX80	U	U	U	U	.	.	U	.
MSL	.	.	.	542	Oregon ash	Fraxinus	latifolia	FRLA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	543	black ash	Fraxinus	nigra	FRNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	5493	Caucasian ash	Fraxinus	oxycarpa	FROX	U	U	U	U	.	.	U	.
MSL	.	.	.	544	green ash	Fraxinus	pennsylvanica	FRPE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	545	pumpkin ash	Fraxinus	profunda	FRPR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	546	blue ash	Fraxinus	quadrangulata	FRQU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	549	Texas ash	Fraxinus	texensis	FRTE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7206	shamel ash	Fraxinus	uhdei	FRUH	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	547	velvet ash	Fraxinus	velutina	FRVE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7207	Bolivian fuchsia	Fuchsia	boliviana	FUBO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7208	shrubby fuchsia	Fuchsia	paniculata	FUPA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7210	silkrubber	Funtumia	elastica	FUEL	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7212	Gourka	Garcinia	dulcis	GADU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7213	lemon saptree	Garcinia	hessii	GAHE5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7214	mangosteen	Garcinia	mangostana	GAMA10	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7215	tilol	Garcinia	matsudai	GAMA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7216	garcinia	Garcinia	myrtifolia	GAMY	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7217	konpuil	Garcinia	ponapensis	GAPO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7218	palo de cruz	Garcinia	portoricensis	GAPO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7220	Garcinia quadrilocularis	Garcinia	quadrilocularis	GAQU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7219	tilol	Garcinia	rumiyo	GARU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7223	Garcinia xanthochymus	Garcinia	xanthochymus	GAXA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7224	forest gardenia	Gardenia	brighamii	GABR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7225	Oahu gardenia	Gardenia	mannii	GAMA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7226	Remys gardenia	Gardenia	remyi	GARE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7227	gardenia	Gardenia	spp.	GARDE	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7228	Tahitian gardenia	Gardenia	taitensis	GATA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7229	manuai vivao	Garuga	floribunda	GAFL8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7231	llume	Gaussia	attenuata	GAAT	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7233	taipoipo	Geniostoma	rupestre	GERU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7235	jagua	Genipa	americana	GEAM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7237	arbol de Navidad	Gesneria	pedunculosa	GEPE4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	561	ginkgo, maidenhair tree	Ginkgo	biloba	GIBI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7239	bastard gregre	Ginoria	rohrii	GIRO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7241	Gironniera celtidifolia	Gironniera	celtidifolia	GICE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	551	waterlocust	Gleditsia	aquatica	GLAQ	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	552	honeylocust	Gleditsia	triacanthos	GLTR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7245	quickstick	Gliricidia	sepium	GLSE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7247	masame	Glochidion	cuspidatum	GLCU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7257	Glochidion kanehirae	Glochidion	kanehirae	GLKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7248	Glochidion marianum	Glochidion	marianum	GLMA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7250	Glochidion	Glochidion	spp.	GLOCH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7255	flower axistree	Glycosmis	parviflora	GLPA4	U	U	U	U	.	.	U	.
MSL	.	.	.	7251	belau	Gmelina	elliptica	GMEL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7252	blacheos	Gmelina	palawensis	GMPA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7254	Gnetum gnemon	Gnetum	gnemon	GNGN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7256	mata buey	Goetzea	elegans	GOEL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7258	grand merisier	Gomidesia	lindeniana	GOLI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7260	Goniothalamus carolinensis	Goniothalamus	carolinensis	GOCA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	555	loblolly-bay	Gordonia	lasianthus	GOLA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	3	.	7262	Creole cotton	Gossypium	barbadense	GOBA	U	P, U	U	C, U	C	P	.	.
MSL	IOS	.	.	7264	upland cotton	Gossypium	hirsutum	GOHIH2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7268	Graffenrieda ottoschulzii	Graffenrieda	ottoschulzii	GROT	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7272	kahiliflower	Grevillea	banksii	GRBA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7273	silkoak	Grevillea	robusta	GRRO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7279	lignum-vitae	Guaiacum	officinale	GUOF	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7280	holywood	Guaiacum	sanctum	GUSA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7282	paipai	Guamia	mariannae	GUMA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	882	beeftree, longleaf blolly	Guapira	discolor	GUDI	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7285	black mampoo	Guapira	fragrans	GUFR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7286	corcho prieto	Guapira	obtusata	GUOB	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7288	alligatorwood	Guarea	glabra	GUGL3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7290	American muskwood	Guarea	guidonia	GUGU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7294	haya minga	Guatteria	blainii	GUBL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7295	haya blanca	Guatteria	caribaea	GUCA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7298	bastardcedar	Guazuma	ulmifolia	GUUL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7299	hammock velvetseed	Guettarda	elliptica	GUEL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7300	frogwood	Guettarda	krugii	GUKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7302	cucubano de vieques	Guettarda	odorata	GUOD	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7303	cucubano	Guettarda	ovalifolia	GUOV	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7305	roseta	Guettarda	pungens	GUPU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7306	wild guave	Guettarda	scabra	GUSC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7307	puapua	Guettarda	speciosa	GUSP3	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7309	cucubano de monte	Guettarda	valenzuelana	GUVA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7311	rhoifolia	Guioa	rhoifolia	GURH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7313	bochela uchererak, uch	Gulubia	palauensis	GUPA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7315	West Indian false box	Gyminda	latifolia	GYLA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7317	oysterwood	Gymnanthes	lucida	GYLU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	571	Kentucky coffeetree	Gymnocladus	dioicus	GYDI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7319	vilivili	Gyrocarpus	americanus	GYAM2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7321	bloodwoodtree	Haematoxylum	campechianum	HACA2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7327	palo de hueso	Haenianthus	salicifolius	HASAO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	581	Carolina silverbell	Halesia	carolina	HACA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	582	two-wing silverbell	Halesia	diptera	HADI3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	IOS	.	.	7330	scarletbush	Hamelia	patens	HAPA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7332	Haplolobus floribundus	Haplolobus	floribundus	HAFL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7333	South African wild plum	Harpephyllum	caffrum	HACA10	U	U	U	U	.	.	U	.
MSL	.	.	.	7334	fa`aili	Harpullia	arborea	HAAR4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7335	haujillo	Havardia	pallens	HAPA10	U	U	U	U	.	.	U	.
MSL	.	.	.	7336	false locust	Hebestigma	cubense	HECU10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7338	denticulata	Hedycarya	denticulata	HEDE14	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7341	cigarbush	Hedyosmum	arborescens	HEAR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7343	Fosbergs starviolet	Hedyotis	fosbergii	HEFO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7344	manono	Hedyotis	hillebrandii	HEHI8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7345	starviolet	Hedyotis	spp.	HEDYO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7346	variable starviolet	Hedyotis	terminalis	HETE21	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7347	screwtree	Helicteres	jamaicensis	HEJA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7349	white moho	Heliocarpus	popayanensis	HEPO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7353	camasey peludo	Henriettea	fascicularis	HEFA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7354	MacFadyen's camasey	Henriettea	macfadyenii	HEMA11	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7355	thinleaf camasey	Henriettea	membranifolia	HEME5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7357	jusillo	Henriettea	squamulosum	HESQ	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7359	ufa	Heritiera	littoralis	HELI9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7360	ufa halemtano	Heritiera	longipetiolata	HELO12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7368	Hernandia labyrinthica	Hernandia	labyrinthica	HELA27	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7363	pipi	Hernandia	moerenhoutiana	HEMO13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7364	pua, Chinese lantern tree	Hernandia	nymphaeifolia	HENY	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7365	Hernandia ovigera	Hernandia	ovigera	HEOV4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7366	mago	Hernandia	sonora	HESO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7370	Lanai island-aster	Hesperomannia	arborescens	HEAR9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7371	Maui island-aster	Hesperomannia	arbuscula	HEAR10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7372	Kauai island-aster	Hesperomannia	lydgatei	HELY	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7377	palma brava	Heterospathe	elata	HEEL9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7381	para rubber tree	Hevea	brasiliensis	HEBR8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7384	hau kuahiwi	Hibiscadelphus	bombycinus	HIBO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7385	lava hau kuahiwi	Hibiscadelphus	crucibracteatus	HICR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7386	Kauai hau kuahiwi	Hibiscadelphus	distans	HIDI	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7387	Kilauea hau kuahiwi	Hibiscadelphus	giffardianus	HIGI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7388	Hualalai hau kuahiwi	Hibiscadelphus	hualalaiensis	HIHU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7389	hau kuahiwi	Hibiscadelphus	x puakuahiwi	HIPU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7391	Maui hau kuahiwi	Hibiscadelphus	wilderianus	HIWI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7392	Woods hau kuahiwi	Hibiscadelphus	woodii	HIWO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7393	white rosemallow	Hibiscus	arnottianus	HIAR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7397	Brackenridges rosemallow	Hibiscus	brackenridgei	HIBR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7401	lemonyellow rosemallow	Hibiscus	calyphyllus	HICA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7402	red Kauai rosemallow	Hibiscus	clayi	HICL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7403	mahoe	Hibiscus	elatus	HIEL	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7404	red rosemallow	Hibiscus	kokio	HIKO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7407	largeleaf rosemallow	Hibiscus	macrophyllus	HIMA5	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	7408	Dixie rosemallow	Hibiscus	mutabilis	HIMU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7409	seaside mahoe	Hibiscus	pernambucensis	HIPE3	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	7410	shoeblackplant	Hibiscus	rosa-sinensis	HIRO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7412	sea hibiscus	Hibiscus	tiliaceus	HITI	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7413	white Kauai rosemallow	Hibiscus	waimeae	HIWA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	883	manchineel	Hippomane	mancinella	HIMA2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7418	teta de burra cinarron	Hirtella	rugosa	HIRU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7420	pigeonberry	Hirtella	triandra	HITR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8008	fanuamamala	Homalanthus	acuminatus	HOAC4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8009	fanuamamala	Homalanthus	nutans	HONU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7422	white cogwood	Homalium	racemosum	HORA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7424	Homalium whitmeeanum	Homalium	whitmeeanum	HOWH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7427	chemeklachel, eumail	Horsfieldia	amklaal	HOAM2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7428	ersachel	Horsfieldia	novoguineensis	HONO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7429	Horsfieldia nunu	Horsfieldia	nunu	HONU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7430	chersachel	Horsfieldia	palauensis	HOPA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7432	Japanese raisintree	Hovenia	dulcis	HODU2	U	U	U	U	.	.	U	.
MSL	.	.	.	7433	sentrypalm	Howeia	forsteriana	HOFO	U	U	U	U	.	.	U	.
MSL	.	.	.	7434	sandbox tree	Hura	crepitans	HUCR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7438	cedro macho	Hyeronima	clusioides	HYCL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7442	West Indian locust, Brazilian cherry, stinkingtoe	Hymenaea	courbaril	HYCO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7445	inkwood	Hypelate	trifoliata	HYTR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7446	limestone snakevine	Hyperbaena	laurifolia	HYLA8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7453	Hawaii holly	Ilex	anomala	ILAN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7454	English holly	Ilex	aquifolium	ILAQ80	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	7455	dahoon	Ilex	cassine	ILCA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7456	te	Ilex	cookii	ILCO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7457	maconcona	Ilex	guianensis	ILGU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7458	Caribbean holly	Ilex	macfadyenii	ILMA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7459	Puerto Rico holly	Ilex	nitida	ILNI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	591	American holly	Ilex	opaca	ILOP	R, U	U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7460	mate	Ilex	paraguariensis	ILPA3	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	7462	gongolin	Ilex	sideroxyloides	ILSI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7463	Sintenis' holly	Ilex	sintenisii	ILSI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7465	Urban's holly	Ilex	urbaniana	ILUR	U	U	U	C, U	C	.	.	.
MSL	.	8	.	7469	yaupon	Ilex	vomitoria	ILVO	U	U	U	U	.	.	U	.
MSL	.	.	.	7472	ice cream bean	Inga	edulis	INED	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7470	sacky sac bean	Inga	laurina	INLA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7471	Inga nobilis	Inga	nobilis	INNOQ	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7467	inga	Inga	spp.	INGA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7474	river koko	Inga	vera	INVE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7475	ifi	Inocarpus	fagifer	INFA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7477	ifilele	Intsia	bijuga	INBI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7479	palo de hierro	Ixora	ferrea	IXFE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7481	white jungleflame	Ixora	thwaitesii	IXTH	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7482	black poui	Jacaranda	mimosifolia	JAMI	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7485	braceletwood	Jacquinia	armillaris	JAAR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7487	bois bande	Jacquinia	berteroi	JABE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7491	Barbados nut	Jatropha	curcas	JACU2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7492	wild oilnut	Jatropha	hernandiifolia	JAHE	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	7493	coralbush	Jatropha	multifida	JAMU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	604	southern California black walnut	Juglans	californica	JUCA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	601	butternut	Juglans	cinerea	JUCI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	603	northern California black walnut	Juglans	hindsii	JUHI	R, U	PNWS, U	U	U	.	.	.	P2
MSL	.	.	.	7495	West Indian walnut	Juglans	jamaicensis	JUJA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	606	Arizona walnut	Juglans	major	JUMA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	605	Texas walnut	Juglans	microcarpa	JUMI	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	602	black walnut	Juglans	nigra	JUNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7496	English walnut	Juglans	regia	JURE80	U	U	U	U	.	.	U	.
MSL	.	.	.	7497	ketenguit	Kayea	pacifica	KAPA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7499	Khaya anthotheca	Khaya	anthotheca	KHAN	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7501	Senegal mahogany	Khaya	senegalensis	KHSE2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7503	Kigelia africana	Kigelia	africana	KIAF	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7506	guest tree	Kleinhovia	hospita	KLHO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7507	goldenrain tree	Koelreuteria	bipinnata	KOBI3	U	U	U	U	.	.	U	.
MSL	.	.	.	7515	goldenrain tree	Koelreuteria	paniculata	KOPA	U	U	U	U	.	.	U	.
MSL	.	.	.	7509	Molokai treecotton	Kokia	cookei	KOCO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7510	Hawaii treecotton	Kokia	drynarioides	KODR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7511	Kauai treecotton	Kokia	kauaiensis	KOKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7512	Wailupe Valley treecotton	Kokia	lanceolata	KOLA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7514	leadwood	Krugiodendron	ferreum	KRFE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7516	burgan	Kunzea	ericoides	KUER	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7518	summit labordia	Labordia	fagraeoidea	LAFA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7519	bog labordia	Labordia	hedyosmifolia	LAHE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7520	mountain labordia	Labordia	hirtella	LAHI5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7521	Waianae Range labordia	Labordia	kaalae	LAKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7522	Wahiawa Mountain labordia	Labordia	lydgatei	LALY2	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	7523	labordia	Labordia	spp.	LABOR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7524	paleflower labordia	Labordia	tinifolia	LATI2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7528	Lanai labordia	Labordia	triflora	LATR4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7529	Nevada peavine	Labordia	waiolani	LAWA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7531	golden chain tree	Laburnum	anagyroides	LAAN2	U	U	U	U	.	.	U	.
MSL	.	.	.	7530	cuero de rana	Laetia	procera	LAPR2	U	U	U	C, U	C	.	.	.
MSL	.	.	w	7532	crapemyrtle	Lagerstroemia	indica	LAIN	.	U	U	C, U	C	.	.	.
MSL	.	.	.	7533	pride of India	Lagerstroemia	speciosa	LASP	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	988	white mangrove	Laguncularia	racemosa	LARA2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7539	Langsat	Lansium	domesticum	LADO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7541	nino de cota	Laplacea	portoricensis	LAPO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7543	bluelatan	Latania	loddigesii	LALO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7550	henna	Lawsonia	inermis	LAIN5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7552	Krug's roughleaf	Leandra	krugiana	LEKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7556	pitahaya	Leptocereus	quadricostatus	LEQU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7558	large-leaf yellow teatree	Leptospermum	morrisonii	LEMO20	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7559	common teatree	Leptospermum	petersonii	LEPE23	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7560	common teatree	Leptospermum	polygalifolim	LEPO22	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7561	broom teatree	Leptospermum	scoparium	LESC2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7562	teatree	Leptospermum	spp.	LEPTO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7565	white leadtree	Leucaena	leucocephala	LELE10	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	869	Great leucaene	Leucaena	pulverulenta	LEPU3	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	7567	littleleaf leadtree	Leucaena	retusa	LERE5	U	U	U	U	.	.	U	.
MSL	.	.	.	7569	Maria laurel	Licaria	brittoniana	LIBR5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7570	Puerto Rico cinnamon	Licaria	parvifolia	LIPA9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7573	pepperleaf sweetwood	Licaria	triandra	LITR	U	U	U	C, U	C	.	.	.
MSL	.	8	w	7577	Japanese privet	Ligustrum	japonicum	LIJA	.	U	U	U	.	.	U	.
MSL	.	8	w	7578	glossy privet	Ligustrum	lucidum	LILU2	.	U	U	U	.	.	U	.
MSL	.	.	.	7571	Oriental sweetgum	Liquidambar	orientalis	LIOR2	.	U	U	U	.	.	U	.
MSL	.	.	.	611	sweetgum	Liquidambar	styraciflua	LIST2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	621	yellow-poplar	Liriodendron	tulipifera	LITU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7583	Lychee	Litchi	chinensis	LICH4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	631	tanoak	Lithocarpus	densiflorus	LIDE3	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	7586	papaono	Litsea	samoensis	LISA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7588	fountain palm	Livistona	chinensis	LICH3	U	P, U	U	U	.	P	U	.
MSL	.	.	.	7590	geno geno	Lonchocarpus	domingensis	LODO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7591	geno	Lonchocarpus	glaucifolius	LOGL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7592	broadleaf lancepod	Lonchocarpus	heptaphyllus	LOHE7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7595	vinegartree	Lophostemon	confertus	LOCO9	U	P, U	U	U	.	P	U	.
MSL	.	.	.	7600	luehea	Luehea	speciosa	LUSP11	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7602	bakauaine, nana	Lumnitzera	littorea	LULI8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7606	Lunania ekmanii	Lunania	ekmanii	LUEK	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7608	St. Thomas staggerbush	Lyonia	rubiginosa	LYRU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	884	false tamarind	Lysiloma	latisiliquum	LYLA3	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7614	macadamia nut tree, pengua	Macadamia	integrifolia	MAIN8	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	7617	Macadamia Nut	Macadamia	tetraphylla	MATE16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7618	bedel	Macaranga	carolinensis	MACA25	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7619	Macaranga grayana	Macaranga	grayana	MAGR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7620	lau pata	Macaranga	harveyana	MAHA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7621	pengua	Macaranga	mappa	MAMA28	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7625	lau fatu	Macaranga	stipulosa	MAST7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7626	parasol leaf tree	Macaranga	tanarius	MATA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7627	Macaranga thompsonii	Macaranga	thompsonii	MATH3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7628	palo de hoz	Machaerium	lunatum	MALU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7630	Puerto Rico alfilerillo	Machaonia	portoricensis	MAPO6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	641	Osage-orange	Maclura	pomifera	MAPO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7632	Maclura tinctoria	Maclura	tinctoria	MATI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7633	umbrella-tree	Maesopsis	eminii	MAEM2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	651	cucumbertree	Magnolia	acuminata	MAAC	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	655	mountain or Fraser magnolia	Magnolia	fraseri	MAFR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	652	southern magnolia	Magnolia	grandiflora	MAGR4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	654	bigleaf magnolia	Magnolia	macrophylla	MAMA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7635	Puerto Rico magnolia	Magnolia	portoricensis	MAPO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	657	pyramid magnolia	Magnolia	pyramidata	MAPY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7636	laurel magnolia	Magnolia	splendens	MASP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7631	star magnolia	Magnolia	stellata	MAST6	.	.	.	.	.	.	.	.
MSL	.	.	.	658	umbrella magnolia	Magnolia	tripetala	MATR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	653	sweetbay	Magnolia	virginiana	MAVI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7634	Chinese magnolia	Magnolia	x soulangiana	MASO9	.	.	.	.	.	.	.	.
MSL	.	.	.	7639	kamala tree	Mallotus	philippensis	MAPH4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7642	Mallotus tiliifolius	Mallotus	tiliifolius	MATI4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7644	Barbados cherry	Malpighia	emarginata	MAEM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7645	palo bronco	Malpighia	fucata	MAFU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7646	wild crapemyrtle	Malpighia	glabra	MAGL6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7647	cowhage cherry	Malpighia	infestissima	MAIN5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7648	bastard cherry	Malpighia	linearis	MALI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	662	southern crab apple	Malus	angustifolia	MAAN3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7649	Siberian crab apple	Malus	baccata	MABA	U	U	U	U	.	.	U	.
MSL	.	.	.	663	sweet crab apple	Malus	coronaria	MACO5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7650	Japanese flowering crab apple	Malus	floribunda	MAFL80	U	U	U	U	.	.	U	.
MSL	.	.	.	661	Oregon crab apple	Malus	fusca	MAFU	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	664	prairie crab apple	Malus	ioensis	MAIO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7651	paradise apple	Malus	pumila	MAPU	U	U	U	U	.	.	U	.
MSL	.	5,6,10	.	660	apple spp.	Malus	spp.	MALUS	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	7652	mammee apple	Mammea	americana	MAAM2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7653	manapau	Mammea	glauca	MAGL12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7654	chopak	Mammea	odorata	MAOD2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	885	mango	Mangifera	indica	MAIN3	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	7657	kanit	Mangifera	minor	MAMI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7658	saipan mango	Mangifera	odorata	MAOD	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7660	ceara rubbertree	Manihot	carthaginensis ssp. Glaziovii	MACAG4	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7662	bulletwood	Manilkara	bidentata	MABI5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7663	Surinam bulletwood	Manilkara	bidentata ssp. surinamensis	MABIS	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7664	pani	Manilkara	dissecta	MADI14	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7666	kohle	Manilkara	hoshinoi	MAHO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7667	wild dilly	Manilkara	jaimiqui	MAJA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7669	zapote de costa	Manilkara	pleeana	MAPL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7672	udeuid	Manilkara	udoido	MAUD	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7673	nisperillo	Manilkara	valenzuela	MAVA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7674	sapodilla	Manilkara	zapota	MAZA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7677	palo de cana	Mappia	racemosa	MARA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7679	bkau, apgau	Maranthes	corymbosa	MACO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7682	bastard hogberry	Margaritaria	nobilis	MANO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7684	beruquillo	Marlierea	sintenisii	MASI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7688	Matayba apetala	Matayba	apetala	MAAP5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7689	negra lora	Matayba	domingensis	MADO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7694	mayten	Maytenus	boaria	MABO8	U	U	U	U	.	.	U	.
MSL	.	.	.	7695	Caribbean mayten	Maytenus	cymosa	MACY2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7697	Puerto Rico mayten	Maytenus	elongata	MAEL3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7698	white cinnamon	Maytenus	laevigata	MALA8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	715	Maytenus palauica	Maytenus	palauica	MAPA28	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7699	ponce mayten	Maytenus	ponceana	MAPO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7700	luluhut	Maytenus	thompsonii	MATH4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7702	Mecranium latifolium	Mecranium	latifolium	MELA7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7704	Medusanthera carolinensis	Medusanthera	carolinensis	MECA21	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7705	matamo	Medusanthera	samoensis	MESA11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7715	cajeput tree	Melaleuca	linariifolia	MELI7	U	U	U	U	.	.	U	.
MSL	.	.	.	992	melaleuca	Melaleuca	quinquenervia	MEQU	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	7710	alom	Melanolepis	multiglandulosa	MEMU10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	993	chinaberry	Melia	azedarach	MEAZ	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	7717	Spanish lime	Melicoccus	bijugatus	MEBI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7719	mokihana	Melicope	anisata	MEAN3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7720	Ballous melicope	Melicope	balloui	MEBA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7721	uahiapele	Melicope	barbigera	MEBA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7722	Waianae Range melicope	Melicope	christophersenii	MECH2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7723	manena	Melicope	cinerea	MECI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7724	kukaemoa	Melicope	clusiifolia	MECL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7725	piloula	Melicope	cruciata	MECR5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7726	leiohiiaka	Melicope	elliptica	MEEL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7727	Haleakala melicope	Melicope	haleakalae	MEHA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7728	Haupa Mountain melicope	Melicope	haupuensis	MEHA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7729	mokihana kukae moa	Melicope	hawaiensis	MEHA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7730	Monoa melicope	Melicope	hiiakae	MEHI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7731	Honolulu melicope	Melicope	hosakae	MEHO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7732	Kaala melicope	Melicope	kaalaensis	MEKA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7733	Olokele Valley melicope	Melicope	knudsenii	MEKN	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7750	soopini	Melicope	latifolia	MERE8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7734	Kaholuamanu melicope	Melicope	macropus	MEMA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7735	Makaha Valley melicope	Melicope	makahae	MEMA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7736	Molokai melicope	Melicope	molokaiensis	MEMO6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7737	alani	Melicope	mucronulata	MEMU4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7738	Oahu melicope	Melicope	oahuensis	MEOA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7739	Makawao melicope	Melicope	obovata	MEOB4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7740	Honokahua melicope	Melicope	orbicularis	MEOR4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7741	Hana melicope	Melicope	ovalis	MEOV	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7742	eggshape melicope	Melicope	ovata	MEOV2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7743	pale melicope	Melicope	pallida	MEPA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7744	Lihue melicope	Melicope	paniculata	MEPA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7745	boxfruit alani	Melicope	peduncularis	MEPE9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7746	Kohala Summit melicope	Melicope	pseudoanisata	MEPS	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7747	hairy melicope	Melicope	puberula	MEPU4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7748	fourangle melicope	Melicope	quadrangularis	MEQU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7749	kapu melicope	Melicope	radiata	MERA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7751	roundleaf melicope	Melicope	rotundifolia	MERO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7752	St. Johns melicope	Melicope	saint-johnii	MESA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7753	Mt. Kaala melicope	Melicope	sandwicensis	MESA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7754	melicope	Melicope	spp.	MELIC3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7755	volcanic melicope	Melicope	volcanica	MEVO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7756	alani wai	Melicope	waialealae	MEWA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7757	Monoa melicope	Melicope	wawraeana	MEWA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7758	kipuka piaula	Melicope	zahlbruckneri	MEZA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7759	samoensis	Melicytus	samoensis	MESA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7763	aguacatillo	Meliosma	herbertii	MEHE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7764	cacaillo	Meliosma	obtusifolia	MEOB2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7766	mao	Melochia	aristata	MEAR16	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	7768	teabush	Melochia	tomentosa	METO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7769	hierba del soldado	Melochia	umbellata	MEUM3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7771	sayafe	Melochia	villosissima var. villosissima	MEVIV	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7770	sayafe	Melochia	villosissima var. compacta	MEVIC4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7774	faniok	Merrilliodendron	megacarpum	MEME12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7776	fagufagu	Meryta	macrophylla	MEMA16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7777	omechidel	Meryta	senfftiana	MESE11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	886	Florida poisontree	Metopium	toxiferum	METO3	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	7781	collina	Metrosideros	collina	MEPOP2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7782	ohia	Metrosideros	macropus	MEMA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7783	ohia lehua	Metrosideros	polymorpha	MEPO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7792	lehua papa	Metrosideros	rugosa	MERU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7794	lehua ahihi	Metrosideros	tremuloides	METR5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7795	Kauai bottlebrush	Metrosideros	waialealae	MEWA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7798	ivory-nut palm	Metroxylon	amicarum	MEAM4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7799	sago palm	Metroxylon	sagu	MESA7	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7801	Orange Champak	Michelia	champaca	MICH4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7804	saquiyac	Miconia	affinis	MIAF	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7805	velvet tree	Miconia	calvescens	MICA20	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7806	Puerto Rico johnnyberry	Miconia	foveolata	MIFO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7807	camasey de costilla	Miconia	impetiolaris	MIIM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7808	smooth johnnyberry	Miconia	laevigata	MILA8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7803	hairy johnnyberry	Miconia	lanata	MILA10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7810	camasey cuatrocanales	Miconia	mirabilis	MIMI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7812	camasey racimoso	Miconia	pachyphylla	MIPA7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7813	granadillo bobo	Miconia	prasina	MIPR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7814	auquey	Miconia	punctata	MIPU9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7815	ridge johnnyberry	Miconia	pycnoneura	MIPY2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7816	camasey felpa	Miconia	racemosa	MIRA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7817	peralejo	Miconia	rubiginosa	MIRU4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7818	jau jau	Miconia	serrulata	MISE2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7819	mountain johnnyberry	Miconia	sintenisii	MISI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7821	forest johnnyberry	Miconia	subcorymbosa	MISU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7822	rajador	Miconia	tetrandra	MITE4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7823	camasey tomaso	Miconia	thomasiana	MITH	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7824	talafulu	Micromelum	minutum	MIMI23	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7828	caimitillo verde	Micropholis	garciniifolia	MIGA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7829	Micropholis guyanensis	Micropholis	guyanensis	MIGU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7831	pinnata	Millettia	pinnata	MIPI9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7833	elegant mimosa	Mimosa	arenosa	MIAR4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7835	bulletwood, elengi	Mimusops	elengi	MIEL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7839	monodora	Monodora	spp.	MONOD	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7841	treedaisy	Montanoa	hibiscifolia	MOHI	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	7845	Wax Myrtle	Morella	cerifera	MOCE2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7846	firetree	Morella	faya	MOFA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7847	Morella holdridgeana	Morella	holdridgeana	MOHO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7849	Indian mulberry	Morinda	citrifolia	MOCI3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7850	kesengelngel	Morinda	latibractea	MOLA12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7851	Morinda pedunculata	Morinda	pedunculata	MOPE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7853	noni kuahiwi	Morinda	trimera	MOTR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7855	horseradishtree	Moringa	oleifera	MOOL	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7857	ratapple	Morisonia	americana	MOAM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	681	white mulberry	Morus	alba	MOAL	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	683	Texas mulberry	Morus	microphylla	MOMI	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	684	black mulberry	Morus	nigra	MONI	R, U	PNWS, U	R, U	R, C, U	C	.	.	P2
MSL	.	.	.	682	red mulberry	Morus	rubra	MORU2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7862	murta	Mouriri	domingensis	MODO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7863	mameyuelo	Mouriri	helleri	MOHE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7865	falseohe	Munroidendron	racemosum	MURA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7867	strawberrytree	Muntingia	calabura	MUCA4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7869	Murraya exotica	Murraya	exotica	MUEX2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7870	Murraya koenigii	Murraya	koenigii	MUKO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7881	aloalo vao	Mussaenda	raiateensis	MURA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7861	ngaio tree	Myoporum	laetum	MYLA5	U	U	U	U	.	.	U	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	7883	naio	Myoporum	sandwicense	MYSA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7886	red rodwood	Myrcia	citrifolia	MYCI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7887	cieneguillo	Myrcia	deflexa	MYDE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7888	curame	Myrcia	fallax	MYFA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7889	guayabacon	Myrcia	leptoclada	MYLE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7890	ausu	Myrcia	paganii	MYPA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7891	punchberry	Myrcia	splendens	MYSP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7893	twinberry	Myrcianthes	fragrans	MYFR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7894	jaboticaba	Myrciaria	cauliflora	MYCA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7895	guavaberry	Myrciaria	floribunda	MYFL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7899	yamamomo, strawberry tree	Myrica	rubra	MYRU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7902	atoneulu	Myristica	hypargyraea	MYHY2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7903	adepurot	Myristica	insularis	MYIN3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7906	Myristica inutilis	Myristica	inutilis	MYIN4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7905	cercipo	Myrospermum	frutescens	MYFR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7907	balsam of Tolu	Myroxylon	balsamum	MYBA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7910	forest colicwood	Myrsine	alyxifolia	MYAL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7911	leathery colicwood	Myrsine	coriacea	MYCO2	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	7912	Myrsine cubana	Myrsine	cubana	MYCU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7913	summit colicwood	Myrsine	degeneri	MYDE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7914	mountain colicwood	Myrsine	emarginata	MYEM	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7915	streambank colicwood	Myrsine	fernseei	MYFE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7916	Koolau Range colicwood	Myrsine	fosbergii	MYFO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7918	Wahiawa Bog colicwood	Myrsine	helleri	MYHE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7919	Kauai colicwood	Myrsine	kauaiensis	MYKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7920	Kokee colicwood	Myrsine	knudsenii	MYKN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7921	Lanai colicwood	Myrsine	lanaiensis	MYLA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7922	kolea lau nui	Myrsine	lessertiana	MYLE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7923	Hanapepe River colicwood	Myrsine	mezii	MYME2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7929	Myrsine palauensis	Myrsine	palauensis	MYPA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7924	swamp colicwood	Myrsine	petiolata	MYPE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7925	Molokai colicwood	Myrsine	pukooensis	MYPU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7926	kokea lau lii	Myrsine	sandwicensis	MYSA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7928	Mt. Kahili colicwood	Myrsine	wawraea	MYWA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7932	Nectandra coriacea	Nectandra	coriacea	NECO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7933	shinglewood	Nectandra	hihua	NEHI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7934	Nectandra krugii	Nectandra	krugii	NEKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7935	Nectandra membranacea	Nectandra	membranacea	NEME3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7936	Nectandra patens	Nectandra	patens	NEPA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7939	Nectandra turbacensis	Nectandra	turbacensis	NETU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7940	saltwood	Neea	buxifolia	NEBU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7944	kadam	Neolamarckia	cadamba	NECA7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7946	aquilon	Neolaugeria	resinosa	NERE2	U	U	U	C, U	C	.	.	.

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MSL	.	.	.	7948	afa	Neonauclea	forsteri	NEFO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7952	Rambutan	Nephelium	lappaceum	NELA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7953	pulasan	Nephelium	ramboutan-ake	NERA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7954	maaloa	Neraudia	melastomifolia	NEME5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7958	keahi	Nesoluma	polynesicum	NEPO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7960	Hawaii olive	Nestegis	sandwicensis	NESA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7962	kalm, aralm	Neuburgia	celebica	NECE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7964	tree tobacco	Nicotiana	glauca	NIGL	U	P, U	U	U	.	P	U	.
MSL	.	.	.	7966	smallflower aiea	Nothocestrum	breviflorum	NOBR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7967	broadleaf aiea	Nothocestrum	latifolium	NOLA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7968	longleaf aiea	Nothocestrum	longifolium	NOLO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7969	Oahu aiea	Nothocestrum	peltatum	NOPE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7971	kaala rockwort	Nototrichium	humile	NOHU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7972	Hawaii rockwort	Nototrichium	sandwicense	NOSA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	691	water tupelo	Nyssa	aquatica	NYAQ2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	694	swamp tupelo	Nyssa	biflora	NYBI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	692	Ogeechee tupelo	Nyssa	ogeche	NYOG	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	693	blackgum	Nyssa	sylvatica	NYSY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	7976	African bird's-eye bush	Ochna	mossambicensis	OCMO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7978	Thomas birds-eye bush	Ochna	thomasiana	OCTH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7980	Ochroma pyramidale	Ochroma	pyramidale	OCPY	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	7982	holei	Ochrosia	compta	OCCO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7983	island yellowwood	Ochrosia	haleakalae	OCHA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7984	Kauai yellowwood	Ochrosia	kauaiensis	OCKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7985	Hawaii yellowwood	Ochrosia	kilaueaensis	OCKI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7987	langiti	Ochrosia	mariannensis	OCMA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7942	fao	Ochrosia	oppositifolia	OCOP	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7990	laurel espada	Ocotea	floribunda	OCFL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7991	black sweetwood	Ocotea	foeniculacea	OCFO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7994	loblolly sweetwood	Ocotea	leucoxylon	OCLE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7996	nemoca	Ocotea	moschata	OCMO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7997	laurel sassafras	Ocotea	nemodaphne	OCNE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7999	laurel de paloma	Ocotea	portoricensis	OCPO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8001	nemoca cimarrona	Ocotea	spathulata	OCSP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8003	Wright's laurel canelon	Ocotea	wrightii	OCWR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8004	olive	Olea	europaea	OLEU	U	P, U	U	U	.	P	U	.
MSL	.	.	.	8019	amansis, edebsungelked, necklace bead tree	Ormosia	calavensis	ORCA12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8020	peronia	Ormosia	krugii	ORKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8022	kesiamel	Osmoxylon	oliveri	OSOL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8023	kesiamel	Osmoxylon	pachyphyllum	OSPA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	718	kesiamel	Osmoxylon	truncatum	OSTR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	701	eastern hophornbeam	Ostrya	virginiana	OSVI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8027	pincho palo de rosa	Ottoschulzia	rhodoxylon	OTRH	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8029	chicharron amarillo	Ouratea	ilicifolia	OUIL	U	U	U	C, U	C	.	.	.

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MSL	.	.	.	8030	abey amarillo	Ouratea	littoralis	OULI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8032	guanabanilla	Ouratea	striata	OUST	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8033	blacklancewood	Oxandra	lanceolata	OXLA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8034	haya	Oxandra	laurifolia	OXLA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	711	sourwood	Oxydendrum	arboreum	OXAR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8036	miich era ngebard, guiana chestnut	Pachira	aquatica	PAAQ2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8037	wild chestnut	Pachira	insignis	PAIN7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8074	Palaquium karrak	Palaquium	karrak	PAKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8044	gasu	Palaquium	stehlinii	PAST24	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8045	tafetan	Palicourea	alpina	PAAL9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8047	red cappel	Palicourea	crocea	PACR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8049	Palicourea croceoides	Palicourea	croceoides	PACR18	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8051	showy cappel	Palicourea	guianensis	PAGU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8054	chertochet	Pandanus	aimiriikensis	PAAI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8055	matal	Pandanus	cominsii	PACO51	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8060	pahong	Pandanus	dubius	PADU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8053	Pandanus japensis	Pandanus	japensis	PAJA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8067	buuk	Pandanus	kanehirae	PAKA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8072	ongor, ertochet	Pandanus	macrojeanneretia	PAMA32	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8076	ongor, ertochet	Pandanus	palawensis	PAPA38	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8077	peet	Pandanus	patina	PAPA39	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8078	ongor	Pandanus	peliliuensis	PAPE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8082	fasa	Pandanus	reineckei	PARE19	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8084	screwpine	Pandanus	spp.	PANDA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8085	Tahitian screwpine	Pandanus	tectorius	PATE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8088	common screwpine	Pandanus	utilis	PAUT	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8091	rauel	Pangium	edule	PAED4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8099	scratchthroat	Parathesis	crenulata	PACR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8103	sea	Parinari	insularum	PAIN20	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8104	ais	Parinari	laurina	PALA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8107	Parkia korom	Parkia	korom	PAKO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8108	kmekumer	Parkia	parvifoliola	PAPA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8106	parkia	Parkia	spp.	PARKI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8110	Parkia timoriana	Parkia	timoriana	PATI5	U	U	U	C, U	C	.	.	.
MSL	.	3,4	.	8111	Jerusalem thorn	Parkinsonia	aculeata	PAAC3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8115	Texas paloverde	Parkinsonia	texana	PATE10	U	U	U	U	.	.	U	.
MSL	.	.	.	8113	cuachilote	Parmentiera	aculeata	PAAC13	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8114	candle tree	Parmentiera	cereifera	PACE8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	712	paulownia, empress-tree	Paulownia	tomentosa	PATO2	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
MSL	.	.	.	8121	Peltophorum pterocarpum	Peltophorum	pterocarpum	PEPT3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8123	ngis	Pemphis	acidula	PEAC6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8125	butter tree	Pentadesma	butyracea	PEBU4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8127	jiqi	Pera	bumeliifolia	PEBU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8129	Pericopsis mooniana	Pericopsis	mooniana	PEMO13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8131	olomea	Perrottetia	sandwicensis	PESA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7211	avocado	Persea	americana	PEAM3	R, U	P, U	R, U	R, C, U	C	P	.	P2

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MSL	.	.	.	721	redbay	Persea	borbonia	PEBO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8134	canela	Persea	krugii	PEKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6511	swamp bay	Persea	palustris	PEPA37	U	U	U	U	.	.	U	.
MSL	.	.	.	8138	aquacatillo	Persea	urbaniana	PEUR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8141	bastard stopper	Petitia	domingensis	PEDO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8146	Phaleria nisidai	Phaleria	nisidai	PHNI11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6516	Amur corktree	Phellodendron	amurense	PHAM2	U	U	U	U	.	.	U	.
MSL	.	.	.	8143	aquilon prieto	Phialanthus	grandifolius	PHGR11	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8144	candlewood	Phialanthus	myrtilloides	PHMY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8151	Canary Island date palm	Phoenix	canariensis	PHCA13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8152	date palm	Phoenix	dactylifera	PHDA4	U	P, U	U	U	.	P	U	.
MSL	.	.	.	8150	pygmy date palm	Phoenix	roebelenii	PHRO6	U	U	U	U	.	.	U	.
MSL	.	.	.	8154	date palm	Phoenix	sylvestris	PHSY3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8155	Chinese photinia	Photinia	davidiana	PHDA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8157	Tahitian gooseberry tree	Phyllanthus	acidus	PHAC3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8159	pamakani mahu	Phyllanthus	distichus	PHDI10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8160	gamo de costa	Phyllanthus	juglandifolius	PHJU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8162	Phyllanthus orbicularis	Phyllanthus	orbicularis	PHOR10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8164	Florida bitterbush	Picramnia	pentandra	PIPE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8167	bitterwood	Picrasma	excelsa	PIEX	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8169	fustic	Pictetia	aculeata	PIAC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8171	aceitillo	Pilocarpus	racemosus	PIRA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8173	Royen's tree cactus	Pilosocereus	royenii	PIRO6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8175	allspice	Pimenta	dioica	PIDI2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8177	bayrumtree	Pimenta	racemosa	PIRA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8178	bayrumtree	Pimenta	racemosa var. grisea	PIRAG	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8181	chebouch, demailei	Pinanga	insignis	PIIN5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8190	higuillo de hoja menuda	Piper	aduncum	PIAD	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8191	higuillo de limon	Piper	amalago	PIAM2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8192	moth pepper	Piper	blattarum	PIBL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8196	marigold pepper	Piper	marginatum	PIMA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8199	spanish elder	Piper	swartzianum	PISW	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8205	Waimea pipturus	Pipturus	albidus	PIAL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8206	soga	Pipturus	argenteus	PIAR8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8208	stinkwood	Piscidia	carthagenensis	PICA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	887	fishpoison tree	Piscidia	piscipula	PIPI3	R, U	P, U	U	R, U	.	P	.	P2
MSL	.	.	.	8211	corcho bobo	Pisonia	albida	PIAL3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8212	Australasian catchbirdtree	Pisonia	brunoniana	PIBR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8213	grand devils-claws	Pisonia	grandis	PIGR6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8214	aulu	Pisonia	sandwicensis	PISA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8216	water mampoo	Pisonia	subcordata	PISU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8217	umbrella catchbirdtree	Pisonia	umbellifera	PIUM2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8218	Kauai catchbirdtree	Pisonia	wagneriana	PIWA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8219	Chinese pistache	Pistacia	chinensis	PICH4	U	U	U	U	.	.	U	.

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MSL	.	.	.	8220	monkeypod	Pithecellobium	dulce	PIDU	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8223	catclaw blackbead	Pithecellobium	unguis-cati	PIUN	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8226	Hawaii poisonberry tree	Pittosporum	argentifolium	PIAR4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8227	hoawa	Pittosporum	confertiflorum	PICO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8225	kamal	Pittosporum	ferrugineum	PIFE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8228	Waianae Range cheesewood	Pittosporum	flocculosum	PIFL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8229	Waialeale cheesewood	Pittosporum	gayanum	PIGA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8230	Koolau Range cheesewood	Pittosporum	glabrum	PIGL4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8231	hoawa	Pittosporum	halophilum	PIHA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8232	Hawaii cheesewood	Pittosporum	hawaiiense	PIHA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8233	Kona cheesewood	Pittosporum	hosmeri	PIHO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8234	Kauai cheesewood	Pittosporum	kauaiense	PIKA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8224	Mona cheesewood, Pittosporum	Pittosporum	monae	PIMO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8235	royal cheesewood	Pittosporum	napaliense	PINA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8236	Taiwanese cheesewood	Pittosporum	pentandrum	PIPE8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8238	cheesewood	Pittosporum	spp.	PITTO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8239	cream cheesewood	Pittosporum	terminalioides	PITE5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8222	Japanese cheesewood	Pittosporum	tobira	PITO2	U	U	U	U	.	.	U	.
MSL	.	.	.	8240	Australian cheesewood	Pittosporum	undulatum	PIUN2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8241	cape cheesewood	Pittosporum	viridiflorum	PIVI5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8242	alaa	Planchonella	garberi	PLGA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8243	alaa	Planchonella	grayana	PLGR11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8244	alaa	Planchonella	linggensis	PLLI6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8303	lalahag	Planchonella	obovata	PLOB5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8248	mamalava	Planchonella	torricellensis	PLTO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	722	water-elm, planertree	Planera	aquatica	PLAQ	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8253	London planetree	Platanus	hybrida	PLHY3	U	U	U	U	.	.	U	.
MSL	.	.	.	8256	Mexican sycamore	Platanus	mexicana	PLME9	U	U	U	U	.	.	U	.
MSL	.	.	.	731	American sycamore	Platanus	occidentalis	PLOC	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8254	Oriental planetree	Platanus	orientalis	PLOR6	U	U	U	U	.	.	U	.
MSL	.	.	.	730	California sycamore	Platanus	racemosa	PLRA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	732	Arizona sycamore	Platanus	wrightii	PLWR2	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8250	Hawaii pilo kea	Platydesma	remyi	PLRE4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8251	Maui pilo kea	Platydesma	spathulata	PLSP3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8255	chupa gallo	Pleodendron	macranthum	PLMA6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8257	golden hala pepe	Pleomele	aurea	PLAU2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8258	Maui hala pepe	Pleomele	auwahiensis	PLAU5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8259	Lanai hala pepe	Pleomele	fernaldii	PLFE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8260	Waianae Range hala pepe	Pleomele	forbesii	PLFO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8261	royal hala pepe	Pleomele	halapepe	PLHA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8262	Hawaii hala pepe	Pleomele	hawaiiensis	PLHA4	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	8266	nosegaytree	Plumeria	alba	PLAL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8268	Singapore graveyard flower	Plumeria	obtusa	PLOB2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8269	Plumeria obtusa	Plumeria	obtusa var. obtusa	PLOBO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8271	templetree	Plumeria	rubra	PLRU2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8273	yucca plum pine	Podocarpus	coriaceus	POCO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8275	Poitea florida	Poitea	florida	POFL20	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8279	violet tree	Polygala	cowellii	POCO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8280	crevajosa	Polygala	penaea	POPE13	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8283	bungaruau	Polyscias	grandifolia	POGR28	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8284	panax, geranium aralia	Polyscias	guilfoylei	POGU	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8285	Polyscias macgillivrayi	Polyscias	macgillivrayi	POMA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8286	bngei	Polyscias	nodosa	PONO10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8287	tagitagi	Polyscias	samoensis	POSA27	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8288	shield aralia	Polyscias	scutellaria	POSC10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8289	Polyscias	Polyscias	spp.	POLYS4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8290	tava	Pometia	pinnata	POPI12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8292	kattai	Ponapea	hosinoi	POHO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8293	Ponapea ledermanniana	Ponapea	ledermanniana	POLE21	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8295	kisaks	Pongamia	pinnata	POPI4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	752	silver poplar	Populus	alba	POAL7	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	749	narrowleaf cottonwood	Populus	angustifolia	POAN3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	741	balsam poplar	Populus	balsamifera	POBA2	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	747	black cottonwood	Populus	balsamifera ssp. trichocarpa	POBAT	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
MSL	.	.	.	742	eastern cottonwood	Populus	deltoides	PODE3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	748	Fremont cottonwood	Populus	fremontii	POFR2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	743	bigtooth aspen	Populus	grandidentata	POGR4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	744	swamp cottonwood	Populus	heterophylla	POHE4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	753	Lombardy poplar	Populus	nigra	PONI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	746	quaking aspen	Populus	tremuloides	POTR5	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8313	Carolina poplar	Populus	x canadensis	POCA19	U	U	U	U	.	.	U	.
MSL	.	.	.	8314	gray poplar	Populus	x canescens	POCA14	U	U	U	U	.	.	U	.
MSL	.	.	.	8297	Abiu	Pouteria	caimito	POCA43	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8298	elangel, chelangel	Pouteria	calcarea	POCA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8299	eggfruit	Pouteria	campechiana	POCA23	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8300	cocuyo	Pouteria	dictyoneura	PODI5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8301	redmammee	Pouteria	hotteana	POHO4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8302	bullytree	Pouteria	multiflora	POMU6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8304	alaa	Pouteria	sandwicensis	POSA11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8305	mammee sapote	Pouteria	sapota	POSA13	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8307	ahgao	Premna	obtusifolia	PROB	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8308	Premna pubescens	Premna	pubescens	PRPU5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8309	aloalo	Premna	serratifolia	PRSE6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8311	Prestoea acuminata	Prestoea	acuminata	PRACM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8315	Hawaii pritchardia	Pritchardia	affinis	PRAF	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	8316	Maui pritchardia	Pritchardia	arecina	PRAR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8317	Kilauea pritchardia	Pritchardia	beccariana	PRBE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8318	Mt. Eke pritchardia	Pritchardia	forbesiana	PRFO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8319	Makaleha pritchardia	Pritchardia	hardyi	PRHA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8320	loulu lelo	Pritchardia	hillebrandii	PRHI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8321	Waianae Range pritchardia	Pritchardia	kaalae	PRKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8322	Lanai pritchardia	Pritchardia	lanaiensis	PRLA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8323	loulu	Pritchardia	lanigera	PRLA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8324	Limahuli Valley pritchardia	Pritchardia	limahuliensis	PRLI2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8325	Molokai pritchardia	Pritchardia	lowreyana	PRLO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8326	Koolau Range pritchardia	Pritchardia	martii	PRMA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8327	Alakai Swamp pritchardia	Pritchardia	minor	PRMI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8328	Kamalo pritchardia	Pritchardia	munroi	PRMU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8329	fan palm	Pritchardia	pacifica	PRPA11	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8330	Waioli Valley pritchardia	Pritchardia	perlmanii	PRPE7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8331	Nihoa pritchardia	Pritchardia	remota	PRRE	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8336	lands of papa pritchardia	Pritchardia	schattaueri	PRSC	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8337	pritchardia	Pritchardia	spp.	PRITC	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8338	stickybud pritchardia	Pritchardia	viscosa	PRVI2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8339	poleline pritchardia	Pritchardia	waialealeana	PRWA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8340	guasimilla	Prockia	crucis	PRCR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8342	jand	Prosopis	cineraria	PRCI4	U	U	U	C, U	C	.	.	.
MSL	.	.	w	756	honey mesquite	Prosopis	glandulosa	PRGL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8343	mesquite	Prosopis	juliflora	PRJU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8344	kiawe	Prosopis	pallida	PRPA4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	w	758	screwbean mesquite	Prosopis	pubescens	PRPU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	757	velvet mesquite	Prosopis	velutina	PRVE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	769	Allegheny plum	Prunus	alleghaniensis	PRAL5	R, U	U	U	U	.	.	.	P2
MSL	.	.	.	766	American plum	Prunus	americana	PRAM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8350	apricot	Prunus	armeniaca	PRAR3	U	U	U	U	.	.	U	.
MSL	.	.	.	771	sweet cherry	Prunus	avium	PRAV	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	8	.	8345	Carolina laurelcherry	Prunus	caroliniana	PRCA	.	U	U	U	.	.	U	.
MSL	.	.	.	8348	cherry plum	Prunus	cerasifera	PRCE2	U	U	U	U	.	.	U	.
MSL	.	3,6,8	.	772	sour cherry	Prunus	cerasus	PRCE	R, U	U	U	U	.	.	.	P2
MSL	.	.	.	773	European plum	Prunus	domestica	PRDO	R, U	U	U	U	.	.	.	P2
MSL	.	.	.	8351	sweet almond	Prunus	dulcis	PRDU	U	U	U	U	.	.	U	.
MSL	.	3	.	768	bitter cherry	Prunus	emarginata	PREM	R, U	PNWS, U	.	U	.	.	.	P2
MSL	.	.	.	6696	cherry laurel	Prunus	laurocerasus	PRLA5	U	U	U	U	.	.	U	.
MSL	.	.	.	774	Mahaleb cherry	Prunus	mahaleb	PRMA	R, U	U	U	U	.	.	.	P2
MSL	.	.	.	6708	Mexican plum	Prunus	mexicana	PRME	.	.	.	.	.	.	.	.
MSL	.	.	.	8346	West Indian cherry	Prunus	myrtifolia	PRMY	U	U	U	C, U	C	.	.	.
MSL	.	.	.	765	Canada plum	Prunus	nigra	PRNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8347	western cherry laurel	Prunus	occidentalis	PROC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	761	pin cherry	Prunus	pensylvanica	PRPE2	R, U	PNWS, U	.	R, U	.	.	.	P2

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	764	peach	Prunus	persica	PRPE3	R, U	P, U	U	R, U	.	P	.	P2
MSL	.	.	.	8360	Japanese plum	Prunus	salicina	PRSA3	U	U	U	U	.	.	U	.
MSL	.	.	.	762	black cherry	Prunus	serotina	PRSE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8349	Prunus serotina	Prunus	serotina ssp. capuli	PRSEC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	6707	Japanese flowering cherry	Prunus	serrulata	PRSE3	U	U	U	U	.	.	U	.
MSL	.	3,4,5,6,10	.	760	cherry and plum spp.	Prunus	spp.	PRUNU	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	3	.	763	chokecherry	Prunus	virginiana	PRVI	R, U	PNWS, U	.	R, U	.	.	.	P2
MSL	.	.	.	8357	Yoshino flowering cherry	Prunus	x yedoensis	PRYE	U	U	U	U	.	.	U	.
MSL	.	.	.	8352	false breadnut	Pseudolmedia	spuria	PSSP2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8353	Florida cherry palm	Pseudophoenix	sargentii	PSSA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8354	mountain guava	Psidium	amplexicaule	PSAM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8355	strawberry guava	Psidium	cattleianum	PSCA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8356	guava	Psidium	guajava	PSGU	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8358	Psidium longipes	Psidium	longipes	PSLOO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8359	Sintenis' guava	Psidium	sintenisii	PSSI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8361	cachimbo-cumun	Psychotria	berteriana	PSBE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8362	palo de cachimbo	Psychotria	brachiata	PSBR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8363	Browne's wild coffee	Psychotria	brownei	PSBR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8368	chimei	Psychotria	carolinensis	PSCA18	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8413	Psychotria cheathamiana	Psychotria	cheathamiana	PSCH4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8364	Psychotria domingensis	Psychotria	domingensis	PSDO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8365	Koolau Range wild coffee	Psychotria	fauriei	PSFA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8366	largeflower wild coffee	Psychotria	grandiflora	PSGR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8367	cachimbo grande	Psychotria	grandis	PSGR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8369	Kauai wild coffee	Psychotria	greenwelliae	PSGR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8370	Waianae Range wild coffee	Psychotria	hathewayi	PSHA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8373	kopikoula	Psychotria	hawaiiensis	PSHA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8377	woodland wild coffee	Psychotria	hexandra	PSHE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8382	Oahu wild coffee	Psychotria	hexandra ssp. oahuensis	PSHEO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8386	milolii kopiwai	Psychotria	hobdyi	PSHO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8387	matalafi	Psychotria	insularum	PSIN10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8388	kopiko kea	Psychotria	kaduana	PSKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8389	cachimbo de gato	Psychotria	maleolens	PSMA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8390	aplohkateng	Psychotria	mariana	PSYMAR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8391	cachimbo de maricao	Psychotria	maricaensis	PSMA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8392	forest wild coffee	Psychotria	mariniana	PSMA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8393	opiko	Psychotria	mauiensis	PSMA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8395	floating balsamo	Psychotria	nutans	PSNU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8397	hairy wild coffee	Psychotria	pubescens	PSPU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8398	Psychotria rhombocarpa	Psychotria	rhombocarpa	PSRH2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8399	Psychotria rotensis	Psychotria	rotensis	PSRO2	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8400	wild coffee	Psychotria	spp.	PSYCH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8401	leatherleaf wild coffee	Psychotria	wawrae	PSWA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	6381	Olasina	Psydrax	merrillii	CAME35	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8402	alahee	Psydrax	odorata	PSOD	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8404	Kauai pteralyxia	Pteralyxia	kauaiensis	PTKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8405	ridged pteralyxia	Pteralyxia	macrocarpa	PTMA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8407	pterocarpus	Pterocarpus	indicus	PTIN2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8408	Burma padauk	Pterocarpus	macrocarpus	PTMA7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8409	Malabar kino	Pterocarpus	marsupium	PTMA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8410	dragonsblood tree	Pterocarpus	officinalis	PTOF	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8411	Chinese wingnut	Pterocarya	stenoptera	PTST80	U	U	U	U	.	.	U	.
MSL	.	.	.	8412	Ptychococcus ledermannianus	Ptychococcus	ledermannianus	PTLE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8415	Macarthur feather palm	Ptychosperma	macarthuri	PTMA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8416	chesdbuuch	Ptychosperma	palauense	PTPA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8419	pomegranate	Punica	granatum	PUGR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8421	Callery pear	Pyrus	calleryana	PYCA80	U	U	U	U	.	.	U	.
MSL	.	.	.	8423	common pear	Pyrus	communis	PYCO	.	U	U	U	.	.	U	.
MSL	.	.	.	8426	Chinese pear	Pyrus	pyrifolia	PYPY2	.	U	U	U	.	.	U	.
MSL	.	5,6,10	.	8420	pear spp.	Pyrus	Spp.	PYRUS	U	U	U	U	.	.	U	.
MSL	.	.	.	8422	swizzlestick tree	Quararibea	turbinata	QUTU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8427	sawtooth oak	Quercus	acutissima	QUAC80	U	U	U	U	.	.	U	.
MSL	.	.	.	801	California live oak	Quercus	agrifolia	QUAG	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	802	white oak	Quercus	alba	QUAL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	803	Arizona white oak	Quercus	arizonica	QUAR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6768	Arkansas oak	Quercus	arkansana	QUAR2	U	U	U	U	.	.	U	.
MSL	.	.	.	8429	bastard white oak	Quercus	austrina	QUAU	U	U	U	U	.	.	U	.
MSL	.	.	.	804	swamp white oak	Quercus	bicolor	QUBI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8513	Buckley oak	Quercus	buckleyi	QUBU2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	8437	European turkey oak	Quercus	cerris	QUCE	U	U	U	U	.	.	U	.
MSL	.	3,4	.	805	canyon live oak	Quercus	chrysolepis	QUCH2	R, U	PNWS, U	U	U	.	.	.	P2
MSL	.	.	.	806	scarlet oak	Quercus	coccinea	QUCO2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	807	blue oak	Quercus	douglasii	QUDO	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	809	northern pin oak	Quercus	ellipsoidalis	QUEL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	810	Emory oak	Quercus	emoryi	QUEM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	811	Engelmann oak	Quercus	engelmannii	QUEN	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	812	southern red oak	Quercus	falcata	QUFA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8438	Texas live oak	Quercus	fusiformis	QUFU	U	U	U	U	.	.	U	.
MSL	.	.	w	814	Gambel oak	Quercus	gambelii	QUGA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	815	Oregon white oak	Quercus	garryana	QUGA4	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8441	sand live oak	Quercus	geminata	QUGE2	U	U	U	U	.	.	U	.
MSL	.	.	.	6782	Georgia oak	Quercus	georgiana	QUGE	U	U	U	U	.	.	U	.
MSL	.	.	.	851	Chisos oak	Quercus	graciliformis	QUGR	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	8511	Graves oak	Quercus	gravesii	QUGR2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	w	846	gray oak	Quercus	grisea	QUGR3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8449	Darlington oak	Quercus	hemisphaerica	QUHE2	U	U	U	U	.	.	U	.
MSL	.	.	w	843	silverleaf oak	Quercus	hypoleucoides	QUHY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8450	holly oak	Quercus	ilex	QUIL2	U	U	U	U	.	.	U	.
MSL	.	.	.	816	scrub oak	Quercus	ilicifolia	QUIL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	817	shingle oak	Quercus	imbricaria	QUIM	R, U	PNWS, U	R, U	R, U	.	.	.	P2

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	842	bluejack oak	Quercus	incana	QUIN	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	818	California black oak	Quercus	kelloggii	QUKE	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8514	Lacey oak	Quercus	laceyi	QULA	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	819	turkey oak	Quercus	laevis	QULA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	820	laurel oak	Quercus	laurifolia	QULA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	821	California white oak	Quercus	lobata	QULO	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	822	overcup oak	Quercus	lyrata	QULY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	823	bur oak	Quercus	macrocarpa	QUMA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	840	dwarf post oak	Quercus	margarettiae	QUMA6	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	824	blackjack oak	Quercus	marilandica	QUMA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	825	swamp chestnut oak	Quercus	michauxii	QUMI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	841	dwarf live oak	Quercus	minima	QUMI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	826	chinkapin oak	Quercus	muehlenbergii	QUMU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6791	myrtle oak	Quercus	myrtifolia	QUMY	U	U	U	U	.	.	U	.
MSL	.	.	.	827	water oak	Quercus	nigra	QUNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	829	Mexican blue oak	Quercus	oblongifolia	QUOB	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	844	Oglethorpe oak	Quercus	oglethorpensis	QUOG	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	813	cherrybark oak	Quercus	pagoda	QUPA5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	830	pin oak	Quercus	palustris	QUPA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6794	durmast oak	Quercus	petraea	QUPE2	U	U	U	U	.	.	U	.
MSL	.	.	.	831	willow oak	Quercus	phellos	QUPH	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8512	Mexican white oak	Quercus	polymorpha	QUPO2	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	8	.	845	dwarf chinkapin oak	Quercus	prinoides	QUPR	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	832	chestnut oak	Quercus	prinus	QUPR2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6797	English oak	Quercus	robur	QURO2	U	U	U	U	.	.	U	.
MSL	.	.	.	8492	robust oak	Quercus	robusta	QURO3	U	U	U	U	.	.	U	.
MSL	.	.	.	833	northern red oak	Quercus	rubra	QURU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	w	847	netleaf oak	Quercus	rugosa	QURU4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	834	Shumard oak	Quercus	shumardii	QUSH	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	836	Delta post oak	Quercus	similis	QUSI2	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	808	Durand oak	Quercus	sinuata var. sinuata	QUSIS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6799	bastard oak	Quercus	sinuata	QUSI	U	U	U	U	.	.	U	.
MSL	.	.	.	8487	bastard oak	Quercus	sinuata var. breviloba	QUSIB	U	U	U	U	.	.	U	.
MSL	.	.	.	835	post oak	Quercus	stellata	QUST	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8424	cork oak	Quercus	suber	QUSU5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8455	lateleaf oak	Quercus	tardifolia	QUTA	U	U	U	U	.	.	U	.
MSL	.	.	.	828	Texas red oak	Quercus	texana	QUTE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8461	sandpaper oak	Quercus	vaseyana	QUVA5	.	U	U	U	.	.	U	.
MSL	.	.	.	837	black oak	Quercus	velutina	QUVE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	838	live oak	Quercus	virginiana	QUVI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	839	interior live oak	Quercus	wislizeni	QUWI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	IOS	.	.	8425	white indigoberry	Randia	aculeata	RAAC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8430	togo vao	Rapanea	myricifolia	RAMY	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8432	omechidel	Rauvolfia	insularis	RAIN8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8433	palo amargo	Rauvolfia	nitida	RANI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8434	devils-pepper	Rauvolfia	sandwicensis	RASA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8431	poison devils-pepper	Rauvolfia	vomitoria	RAVO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8436	traveler's tree	Ravenala	madagascariensis	RAMA7	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8439	tortugo prieto	Ravenia	urbanii	RAUR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8440	vi vao	Reynoldsia	lanutoensis	RELA	U	P, U	U	U	.	P	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8442	ohe makai	Reynoldsia	sandwicensis	RESA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8444	guama	Reynosia	guama	REGU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8445	Krug's darlingplum	Reynosia	krugii	REKR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8447	sloe	Reynosia	uncinata	REUN	U	U	U	C, U	C	.	.	.
MSL	.	8	.	6918	common buckthorn	Rhamnus	cathartica	RHCA3	U	U	U	U	.	.	U	.
MSL	.	.	.	8456	Rheeda	Rheedia	edulis	RHED4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8458	mangle	Rhizophora	apiculata	RHAP2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8460	Rhizophora lamarckii	Rhizophora	lamarckii	RHLA12	U	P, U	U	U	.	P	.	.
MSL	.	.	.	989	American mangrove	Rhizophora	mangle	RHMA2	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
MSL	.	.	.	8462	mangle hembra	Rhizophora	mucronata	RHMU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8464	Rhizophora stylosa	Rhizophora	stylosa	RHST8	U	P, U	U	U	.	P	.	.
MSL	.	8	.	8466	Rose Myrtle	Rhodomyrtus	tomentosa	RHTO10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8470	African sumac	Rhus	lancea	RHLA11	U	U	U	U	.	.	U	.
MSL	.	3,8	.	8479	prairie sumac	Rhus	lanceolata	RHLA3	U	U	U	U	.	.	U	.
MSL	.	.	.	8467	neneleau	Rhus	sandwicensis	RHSA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8469	tavai	Rhus	taitensis	RHTA	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	8472	castorbean	Ricinus	communis	RICO3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8474	Rinorea carolinensis	Rinorea	carolinensis	RICA16	U	P, U	U	U	.	P	.	.
MSL	.	3,4,5,8	w	902	New Mexico locust	Robinia	neomexicana	RONE	R, U	PNWS, U	.	R, U	.	.	.	P2
MSL	.	.	.	901	black locust	Robinia	pseudoacacia	ROPS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8476	greenheart ebony	Rochefortia	acanthophora	ROAC2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8478	Rochefortia spinosa	Rochefortia	spinosa	ROSP8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8480	Rollinia	Rollinia	deliciosa	RODE5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8481	wild sugar apple	Rollinia	mucosa	ROMU3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8483	cordobancillo	Rondeletia	inermis	ROIN4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8484	cordobancillo peludo	Rondeletia	pilosa	ROPI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8485	Juan Tomas	Rondeletia	portoricensis	ROPO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8489	Puerto Rico royal palm	Roystonea	borinquena	ROBO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8490	Roystonea elata	Roystonea	elata	ROEL	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8491	royal palm	Roystonea	oleracea	ROOL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	909	royal palm spp.	Roystonea	spp.	ROYST	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	8494	Puerto Rico palmetto	Sabal	causiarum	SACA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	911	Mexican palmetto	Sabal	mexicana	SAME8	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	912	cabbage palmetto	Sabal	palmetto	SAPA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8499	white hogwood	Sagraea	umbrosa	SAUM3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	927	white willow	Salix	alba	SAAL2	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	921	peachleaf willow	Salix	amygdaloides	SAAM2	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	8	.	925	coastal plain willow	Salix	caroliniana	SACA5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	6954	Elaeagnus willow	Salix	elaeagnos	SAEL	U	U	U	U	.	.	U	.
MSL	.	.	.	6955	crack willow	Salix	fragilis	SAFR	.	.	.	.	.	.	.	.
MSL	.	.	.	8501	Salix humboldtiana	Salix	humboldtiana	SAHU	U	U	U	C, U	C	.	.	.
MSL	.	1,2,3,4,5,6,8	.	8504	arroyo willow	Salix	lasiolepis	SALA6	.	U	U	U	.	.	U	.
MSL	.	.	.	922	black willow	Salix	nigra	SANI	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	926	balsam willow	Salix	pyrifolia	SAPY	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	929	weeping willow	Salix	x sepulcralis	SASE10	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8503	etkeam, cheskeam	Samadera	indica	SAIN13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8505	raintree	Samanea	saman	SASA10	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8556	guayabilla	Samyda	dodecandra	SADO7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8515	santol, kechapi	Sandoricum	koetjape	SAKO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8518	sandalwood	Santalum	album	SAAL16	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8516	coastal sandalwood	Santalum	ellipticum	SAEL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8517	forest sandalwood	Santalum	freycinetianum	SAFR4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8521	Haleakala sandalwood	Santalum	haleakalae	SAHA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8522	mountain sandalwood	Santalum	paniculatum	SAPA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8525	willowleaf sandalwood	Santalum	salicifolium	SASA8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8528	lonomea	Sapindus	oahuense	SAOA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	919	western soapberry	Sapindus	saponaria var. drummondii	SASAD	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	8529	wingleaf soapberry	Sapindus	saponaria	SASA4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8532	vitiensis	Sapindus	vitiensis	SAVI17	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8533	gumtree	Sapium	glandulosum	SAGL5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8535	hinchahuevos	Sapium	laurifolium	SALA25	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8536	milktree	Sapium	laurocerasus	SALA8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8544	uunu	Sarcopygme	pacifica	SAPA35	U	P, U	U	U	.	P	.	.
MSL	.	.	.	931	sassafras	Sassafras	albidum	SAAL5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8546	amansa guapo	Savia	sessiliflora	SASE6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8554	Florida boxwood	Schaefferia	frutescens	SCFR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	888	octopus tree, schefflera	Schefflera	actinophylla	SCAC2	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	8557	yuquilla	Schefflera	gleasonii	SCGL6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8553	Schefflera kraemeri	Schefflera	kraemeri	SCKR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8558	matchwood	Schefflera	morototonii	SCMO10	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8559	samoensis	Schefflera	samoensis	SCSA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8561	Peruvian peppertree	Schinus	molle	SCMO	U	P, U	U	U	.	P	U	.
MSL	IOS	.	.	8563	Brazilian peppertree	Schinus	terebinthifolius	SCTE	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8565	Brazilian firetree	Schizolobium	parahybum	SCPA23	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8567	lac tree	Schleichera	oleosa	SCOL3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7564	Schleinitzia fosbergii	Schleinitzia	fosbergii	SCFO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8571	arana	Schoepfia	arenaria	SCAR2	U	U	U	C, U	C	.	.	.
MSL	.		.	8572	white beefwood	Schoepfia	obovata	SCOB	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8573	gulf graytwig	Schoepfia	schreberi	SCSC3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8577	kuat	Scyphiphora	hydrophyllacea	SCHY5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8583	poumuli	Securinega	flexuosa	SEFL9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8585	poison tree, panew	Semecarpus	kraemeri	SEKR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8586	tonget	Semecarpus	venenosa	SEVE4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8588	emperor's candlesticks	Senna	alata	SEAL4	U	P, U	U	C, U	C	P	.	.
MSL	IOS	.	.	8589	flor de San Jose	Senna	atomaria	SEAT3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8590	Gaudichauds senna	Senna	gaudichaudii	SEGA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8591	false sicklepod	Senna	multijuga	SEMU5	U	P, U	U	C, U	C	P	.	.
MSL	IOS	.	.	8592	valamuerto	Senna	pendula	SEPE4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8594	retama prieta	Senna	polyphylla	SEPO5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8595	senna	Senna	septemtrionalis	SESE13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8596	Siamese cassia	Senna	siamea	SESI3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8597	casia amarilla	Senna	spectabilis	SESP9	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8598	senna	Senna	spp.	SENNA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8599	Senna sulfurea	Senna	sulfurea	SESU10	U	P, U	U	C, U	C	P	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8600	glossy shower	Senna	surattensis	SESU4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8601	ukall	Serianthes	kanehirae	SEKA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8603	hayun lago, trongkon guafi	Serianthes	nelsonii	SENE9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8605	vegetable hummingbird	Sesbania	grandiflora	SEGR5	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8606	Egyptian riverhemp	Sesbania	sesban	SESE8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8608	Shirakiopsis indica	Shirakiopsis	indica	SHIN	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8612	saffron plum	Sideroxylon	celastrinum	SICE2	U	U	U	U	.	.	U	.
MSL	.	.	.	8611	espejuelo	Sideroxylon	cubense	SICU7	U	U	U	C, U	C	.	.	.
MSL	.	.	.	890	false mastic	Sideroxylon	foetidissimum	SIFO	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	8618	Tamaulipan Coma	Sideroxylon	laetevirens	SILA4	U	U	U	U	.	.	U	.
MSL	.	.	.	381	chittamwood, gum bumelia	Sideroxylon	lanuginosum ssp. lanuginosum	SILAL3	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	8615	buckthorn bully	Sideroxylon	lycioides	SILY	U	U	U	U	.	.	U	.
MSL	.	.	.	8613	breakbill	Sideroxylon	obovatum	SIOB	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8621	Bully tree	Sideroxylon	persimile	SIPE11	.	.	.	.	.	.	.	.
MSL	.	.	.	8614	Puerto Rico bully	Sideroxylon	portoricense	SIPO3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	891	white bully, willow bustic	Sideroxylon	salicifolium	SISA6	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	8616	tough bully	Sideroxylon	tenax	SITE2	U	U	U	U	.	.	U	.
MSL	.	.	.	895	paradisetree	Simarouba	glauca	SIGL3	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	8617	simarouba	Simarouba	spp.	SIMAR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8619	aceitillo falso	Simarouba	tulae	SITU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8620	hoja menuda	Siphoneugena	densiflora	SIDE6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8623	motillo	Sloanea	amygdalina	SLAM	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8624	bullwood	Sloanea	berteriana	SLBE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8622	bullwood	Sloanea	spp.	SLOAN	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	8628	American black nightshade	Solanum	americanum	SOAM	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	8626	Solanum bahamense	Solanum	bahamense	SOBAB	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	8627	mullein nightshade	Solanum	donianum	SODO3	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	8629	potatotree	Solanum	erianthum	SOER2	U	U	U	C, U	C	.	.	.
MSL	.	8	.	8631	earleaf nightshade	Solanum	mauritianum	SOMA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8632	forest nightshade	Solanum	nudum	SONU4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8633	cakalaka berry	Solanum	polygamum	SOPO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8634	tabacon aspero	Solanum	rugosum	SORU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8636	turkey berry	Solanum	torvum	SOTO4	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8639	mangrove	Sonneratia	alba	SOAL10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	870	Texas sophora	Sophora	affinis	SOAF	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	8641	mamani	Sophora	chrysophylla	SOCH	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8648	mescal bean	Sophora	secundiflora	SOSE3	U	U	U	U	.	.	U	.
MSL	IOS	.	.	8643	silver bush	Sophora	tomentosa	SOTO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	935	American mountain-ash	Sorbus	americana	SOAM3	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	936	European mountain-ash	Sorbus	aucuparia	SOAU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	937	northern mountain-ash	Sorbus	decora	SODE3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8660	maras	Soulamea	amara	SOAM2	U	P, U	U	U	.	P	.	.

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8644	African tuliptree	Spathodea	campanulata	SPCA2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8646	Spiraeanthemum samoense	Spiraeanthemum	samoense	SPSA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8649	Spondias dulcis	Spondias	dulcis	SPDU3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8650	yellow mombin	Spondias	mombin	SPMO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8656	titmel	Spondias	pinnata	SPPI4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8652	purple mombin	Spondias	purpurea	SPPU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8654	cobana negra	Stahlia	monosperma	STMO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8655	ngmui	Stemonurus	ammui	STAM10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8664	Panama tree	Sterculia	apetala	STAP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8665	fanaio	Sterculia	fanaiho	STFA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8666	hazel sterculia	Sterculia	foetida	STFO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8667	Sterculia palauensis	Sterculia	palauensis	STPA20	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8868	Sterculia ponapensis	Sterculia	ponapensis	STPO10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8675	Stewartia	Stewartia	koreana	STKO2	U	U	U	U	.	.	U	.
MSL	.	.	.	8669	anthropophagorum	Streblus	anthropophagorum	STAN9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8670	Hawaii roughbush	Streblus	pendulinus	STPE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8647	Japanese pagoda tree	Styphnolobium	japonicum	STJA9	U	U	U	U	.	.	U	.
MSL	.	.	.	8674	palo de jazmin	Styrax	portoricensis	STPO3	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	8676	bay cedar	Suriana	maritima	SUMA2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8679	Honduras mahogany	Swietenia	macrophylla	SWMA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	940	West Indian mahogany	Swietenia	mahagoni	SWMA2	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	8678	mahogany	Swietenia	spp.	SWIET	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8686	queen palm	Syagrus	romanzoffiana	SYRO4	U	U	U	U	.	.	U	.
MSL	.	.	.	8683	nispero cimarron	Symplocos	lanata	SYLA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8684	Martinique sweetleaf	Symplocos	martinicensis	SYMA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8685	aceitunilla	Symplocos	micrantha	SYMI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8687	chebtui, ebtui	Symplocos	racemosa	SYRA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8689	turpentine tree	Syncarpia	glomulifera	SYGL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8691	miraculous berry	Synsepalum	dulcificum	SYDU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7092	Japanese tree lilac	Syringa	reticulata	SYRE2	U	U	U	U	.	.	U	.
MSL	.	.	.	8694	watery roseapple	Syzygium	aqueum	SYAQ	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8695	asi	Syzygium	brevifolium	SYBR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8696	popona	Syzygium	carolinense	SYCA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8697	asi vai	Syzygium	clusiifolium	SYCL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	896	Java plum	Syzygium	cumini	SYCU	R, U	P, U	U	R, U	.	P	.	P2
MSL	.	.	.	8699	asi vai	Syzygium	dealatum	SYDE3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8698	sea apple	Syzygium	grande	SYGR2	U	U	U	U	.	.	U	.
MSL	.	.	.	8700	asi	Syzygium	inophylloides	SYIN2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8701	Syzygium jambos	Syzygium	jambos	SYJA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8702	Malaysian apple	Syzygium	malaccense	SYMA2	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8707	brush cherry	Syzygium	paniculatum	SYPA7	U	U	U	U	.	.	U	.
MSL	.	.	.	8703	popona	Syzygium	richii	SYRI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8704	nonu vao	Syzygium	samarangense	SYSA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8705	fena vao	Syzygium	samoense	SYSA6	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8706	ohia ha	Syzygium	sandwicense	SYSA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8708	syzygium	Syzygium	spp.	SYZYG	U	P, U	U	U	.	P	.	.
MSL	.	.	.	7099	luluhut	Syzygium	stelechanthum	SYST3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8709	roble amarillo	Tabebuia	chrysantha	TACH3	U	U	U	C, U	C	.	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8710	primavera	Tabebuia	donnell-smithii	TADO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8712	roble cimarron	Tabebuia	haemantha	TAHA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8713	white cedar	Tabebuia	heterophylla	TAHE	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8714	pink tabebuia	Tabebuia	pallida	TAPA10	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8715	roble de sierra	Tabebuia	rigida	TARI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8716	pink trumpet-tree	Tabebuia	rosea	TARO	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8717	roble colorado	Tabebuia	schumanniana	TASC2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8719	Tabernaemontana aurantiaca	Tabernaemontana	aurantiaca	TAAU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8720	milkwood	Tabernaemontana	citrifolia	TACI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8722	Pulu	Tabernaemontana	pandacaqui	TAPA13	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8723	Tabernaemontana rotensis	Tabernaemontana	rotensis	TARO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	897	tamarind	Tamarindus	indica	TAIN2	R, U	P, U	U	R, C, U	C	P	.	P2
MSL	.	.	.	8737	manunu	Tarenna	sambucina	TASA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8741	chestnutleaf trumpetbush	Tecoma	castanifolia	TECA9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8743	yellow trumpetbush	Tecoma	stans	TEST	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8744	teak	Tectona	grandis	TEGR	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8749	kehma	Terminalia	carolinensis	TECA16	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8750	tropical almond	Terminalia	catappa	TECA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8751	esemiich, chesemiich	Terminalia	crassipes	TECR3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8752	esemiich, chesemiich	Terminalia	edulis	TEED	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8754	Ivory Coast almond	Terminalia	ivorensis	TEIV2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8755	tropical almond	Terminalia	kaernbachii	TEKA4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8753	strand tree, sin	Terminalia	litoralis	TELI7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8756	East Indian almond	Terminalia	myriocarpa	TEMY	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8757	Peruvian almond	Terminalia	oblonga	TEOB	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8758	malili	Terminalia	richii	TERI3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8759	talie	Terminalia	samoensis	TESA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8748	tropical almond	Terminalia	spp.	TERMI	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8761	superb terminalia	Terminalia	superba	TESU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8762	saintedwood	Ternstroemia	heptasepala	TEHE3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8763	palo colorado	Ternstroemia	luquillensis	TELU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8764	copey vera	Ternstroemia	peduncularis	TEPE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8766	mamey de cura	Ternstroemia	stahlii	TEST3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8767	el yunque colorado	Ternstroemia	subsessilis	TESU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8768	masa	Tetragastris	balsamifera	TEBA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8770	Flynnsohe	Tetraplasandra	flynnii	TEFL5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8771	Koolau Rangeohe	Tetraplasandra	gymnocarpa	TEGY	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8772	Hawaii ohe	Tetraplasandra	hawaiensis	TEHA2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8773	ohe ohe	Tetraplasandra	kavaiensis	TEKA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8774	ohe mauka	Tetraplasandra	oahuensis	TEOA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8776	Mt. Waialeale ohe	Tetraplasandra	waialealae	TEWA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8777	ohe kiko ola	Tetraplasandra	waimeae	TEWA3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8778	stinkingfish	Tetrazygia	angustifolia	TEAN2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8779	Florida clover ash	Tetrazygia	bicolor	TEBI	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	8780	Puerto Rico clover ash	Tetrazygia	biflora	TEBI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8781	krekre	Tetrazygia	elaeagnoides	TEEL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8783	cenizo	Tetrazygia	urbanii	TEUR	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8784	cacao	Theobroma	cacao	THCA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8786	maga	Thespesia	grandiflora	THGR2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8787	Portia tree	Thespesia	populnea	THPO3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8789	luckynut	Thevetia	peruviana	THPE3	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8793	ceboruquillo	Thouinia	striata	THST2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8794	Puerto Rico ceboruquillo	Thouinia	striata var. portoricensis	THSTP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	913	key thatch palm	Thrinax	morrisii	THMO4	R, U	U	U	R, C, U	C	.	.	P2
MSL	.	.	.	914	Florida thatch palm	Thrinax	radiata	THRA2	R, U	U	U	R, U	.	.	.	P2
MSL	.	.	.	8803	Brazilian glorytree	Tibouchina	granulosa	TIGR3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	951	American basswood	Tilia	americana	TIAM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	952	white basswood	Tilia	americana var. heterophylla	TIAMH	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	953	Carolina basswood	Tilia	americana var. caroliniana	TIAMC	R, U	PNWS, U	U	R, U	.	.	.	P2
MSL	.	.	.	8813	littleleaf linden	Tilia	cordata	TICO2	U	U	U	U	.	.	U	.
MSL	.	.	.	8814	Silver linden	Tilia	tomentosa	TITO	U	U	U	U	.	.	U	.
MSL	.	.	.	8799	Timonius albus	Timonius	albus	TIAL2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8806	Timonius corymbosus	Timonius	corymbosus	TICO7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8800	.	Timonius	ledermannii	TILE4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8807	Timonius mollis	Timonius	mollis	TIMO4	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8801	.	Timonius	ponapensis	TIPO5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8808	Timonius	Timonius	spp.	TIMON	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8809	Timonius subauritus	Timonius	subauritus	TISU3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8810	Timonius timon	Timonius	timon	TITI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8815	tipa	Tipuana	tipu	TITI2	U	U	U	U	.	.	U	.
MSL	.	.	.	8812	Australian redcedar	Toona	ciliata	TOCI	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8816	boje	Torralbasia	cuneifolia	TOCU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8824	velvetleaf soldierbush	Tournefortia	argentea	TOAR2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8825	cold withe	Tournefortia	filiflora	TOFI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8821	Chinese windmill palm	Trachycarpus	fortunei	TRFO3	U	U	U	U	.	.	U	.
MSL	.	.	.	998	unknown dead hardwood	Tree	broadleaf	2TB	R, U	P	R, U	R, C, U	C	P	.	P2
MSL	IOS	.	.	999	other or unknown live tree	Tree	unknown	2TREE	R, U	R, U	R, U	R, C, U	C	.	.	P2
MSL	.	.	.	8827	magele	Trema	cannabina	TRCA33	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8828	Lamarck's trema	Trema	lamarckiana	TRLA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8829	Jamaican nettletree	Trema	micrantha	TRMI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8831	oriental trema	Trema	orientalis	TROR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	994	Chinese tallowtree	Triadica	sebifera	TRSE6	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
MSL	.	.	.	8833	broomstick	Trichilia	hirta	TRHI3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8834	gaita	Trichilia	pallida	TRPA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8836	bariaco	Trichilia	triacantha	TRTR8	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8837	Trichospermum ikutai	Trichospermum	ikutai	TRIK	U	P, U	U	U	.	P	.	.

Section D.1: *FIA TREE SPECIES CODES*

MSL[1]	IOS[2]	NFS P2/3 Sub-lists[3]	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
MSL	.	.	.	8838	elsau, oleiulakersus	Trichospermum	ledermannii	TRLE8	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8839	maouli	Trichospermum	richii	TRRI9	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8844	ant tree	Triplaris	cumingiana	TRCU6	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8846	faia	Tristiropsis	obtusangula	TROB7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8848	white ramoon	Trophis	racemosa	TRRA4	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8849	Trukia carolinensis	Trukia	carolinensis	TRCA7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8850	muttonwood	Turpinia	occidentalis	TUOC	U	U	U	C, U	C	.	.	.
MSL	.	.	.	971	winged elm	Ulmus	alata	ULAL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	972	American elm	Ulmus	americana	ULAM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	973	cedar elm	Ulmus	crassifolia	ULCR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8862	Japanese elm	Ulmus	davidiana	ULDA	U	U	U	U	.	.	U	.
MSL	.	.	.	8851	Chinese elm	Ulmus	parvifolia	ULPA	U	U	U	U	.	.	U	.
MSL	.	.	.	8852	English elm	Ulmus	procera	ULPR	U	U	U	U	.	.	U	.
MSL	.	.	.	974	Siberian elm	Ulmus	pumila	ULPU	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
MSL	.	.	.	975	slippery elm	Ulmus	rubra	ULRU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	976	September elm	Ulmus	serotina	ULSE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	977	rock elm	Ulmus	thomasii	ULTH	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	981	California laurel	Umbellularia	californica	UMCA	R, U	PNWS, U	R, U	U	.	.	.	P2
MSL	.	.	.	8859	Mexican buckeye	Ungnadia	speciosa	UNSP	U	U	U	U	.	.	U	.
MSL	.	.	.	8853	scratchbush	Urera	baccifera	URBA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8854	flameberry	Urera	caracasana	URCA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8855	ortiga	Urera	chlorocarpa	URCH2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8856	hopue	Urera	glabra	URGL	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8857	opuhe	Urera	kaalae	URKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8861	voa vanga	Vangueria	madagascariensis	VAMA5	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8863	Vavaea pauciflora	Vavaea	pauciflora	VAOA5	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8866	Manila palm	Veitchia	merrillii	VEME3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	995	tungoil tree	Vernicia	fordii	VEFO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
MSL	.	.	.	8869	mu oil tree	Vernicia	montana	VEMO3	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8880	Siebold's arrowwood	Viburnum	sieboldii	VISI	U	U	U	U	.	.	U	.
MSL	.	.	.	8871	lilac chastetree	Vitex	agnus-castus	VIAG	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8872	bars, beokel	Vitex	cofassus	VICO17	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8873	higuerillo	Vitex	divaricata	VIDI2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7199	Chinese chastetree	Vitex	negundo	VINE2	U	U	U	U	.	.	U	.
MSL	.	.	.	8874	smallflower chastetree	Vitex	parviflora	VIPA6	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	8876	simpleleaf chastetree	Vitex	trifolia	VITR7	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8881	Wallenia lamarckiana	Wallenia	lamarckiana	WALA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8883	California fan palm	Washingtonia	filifera	WAFI	U	U	U	U	.	.	U	.
MSL	.	.	.	8885	Washington fan palm	Washingtonia	robusta	WARO	U	U	U	U	.	.	U	.
MSL	.	.	.	8886	Weinmannia affinis	Weinmannia	affinis	WEAF	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8887	bastard briziletto	Weinmannia	pinnata	WEPI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8889	alpine false ohelo	Wikstroemia	bicornuta	WIBI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8890	forest false ohelo	Wikstroemia	furcata	WIFU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8891	montane false ohelo	Wikstroemia	monticola	WIMO	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8892	Oahu false ohelo	Wikstroemia	oahuensis	WIOA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8895	Hawaii false ohelo	Wikstroemia	phillyreifolia	WIPH2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8896	Kohala false ohelo	Wikstroemia	pulcherrima	WIPU	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8897	variableleaf false ohelo	Wikstroemia	sandwicensis	WISA	U	P, U	U	U	.	P	.	.

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MSL	.	.	.	8898	Skottsbergs false ohelo	Wikstroemia	skottsbergiana	WISK	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8899	false ohelo	Wikstroemia	spp.	WIKST	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8900	hairy false ohelo	Wikstroemia	villosa	WIVI	U	P, U	U	U	.	P	.	.
MSL	IOS	.	.	8901	tallow wood	Ximenia	americana	XIAM	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8903	lalanyog	Xylocarpus	granatum	XYGR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8904	leilei	Xylocarpus	moluccensis	XYMO2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8906	mucha-gente	Xylosma	buxifolia	XYBU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8902	dense logwood	Xylosma	congestum	XYCO7	U	U	U	U	.	.	U	.
MSL	.	.	.	8907	sawtooth logwood	Xylosma	crenata	XYCR	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8908	Hawaii brushholly	Xylosma	hawaiiensis	XYHA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8909	Xylosma nelsonii	Xylosma	nelsonii	XYNE2	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8910	spiny logwood	Xylosma	pachyphylla	XYPA2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8911	Xylosma samoensis	Xylosma	samoensis	XYSA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8912	white logwood	Xylosma	schaefferioides	XYSC2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8913	Schwaneck's logwood	Xylosma	schwaneckeana	XYSC3	U	U	U	C, U	C	.	.	.
MSL	IOS	.	.	8916	aloe yucca	Yucca	aloifolia	YUAL	U	U	U	C, U	C	.	.	.
MSL	.	3,8	.	8917	Eve's needle	Yucca	faxoniana	YUFA	U	U	U	U	.	.	U	.
MSL	IOS	.	.	8918	moundlily yucca	Yucca	gloriosa	YUGL2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8919	bluestem yucca	Yucca	guatemalensis	YUGU	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8923	Maricao pricklyash	Zanthoxylum	bifoliolatum	ZABI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8924	prickly yellow	Zanthoxylum	caribaeum	ZACA3	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8925	kawau	Zanthoxylum	dipetalum	ZADI	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8928	West Indian satinwood	Zanthoxylum	flavum	ZAFL	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8929	Hawaii pricklyash	Zanthoxylum	hawaiiense	ZAHA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8930	Kauai pricklyash	Zanthoxylum	kauaense	ZAKA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8931	white pricklyash	Zanthoxylum	martinicense	ZAMA	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8932	yellow prickle	Zanthoxylum	monophyllum	ZAMO	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8933	Oahu pricklyash	Zanthoxylum	oahuense	ZAOA	U	P, U	U	U	.	P	.	.
MSL	.	.	.	8934	dotted pricklyash	Zanthoxylum	punctatum	ZAPU2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8935	niaragato	Zanthoxylum	spinifex	ZASP	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8937	St. Thomas pricklyash	Zanthoxylum	thomasianum	ZATH	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8938	Zapoteca portoricensis	Zapoteca	portoricensis	ZAPO2	U	U	U	C, U	C	.	.	.
MSL	.	.	.	7243	Japanese zelkova	Zelkova	serrata	ZESE80	U	U	U	U	.	.	U	.
MSL	.	.	.	8939	Indian jujube	Ziziphus	mauritiana	ZIMA	U	P, U	U	C, U	C	P	.	.
MSL	.	.	.	8940	cacao rojo	Ziziphus	reticulata	ZIRE	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8941	soana	Ziziphus	rignonii	ZIRI	U	U	U	C, U	C	.	.	.
MSL	.	.	.	8943	Taylor's jujube	Ziziphus	taylorii	ZITA	U	U	U	C, U	C	.	.	.

1. **Master Species List (MSL)**
2. **Islands Only Species (IOS) - Not valid on the Mainland**
3. **Mainland NFS P2/P3 Sub-lists - Not valid on P2/P3 plots within a specific NFS Region**
4. **Entries in this column also contain the variety name when the variety clarifies the species, or subspecies name when the subspecies clarifies the species.**

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APPENDIX E FOREST TYPE CODES

SECTION E.1 FOREST TYPE CODES

The following list includes all forest types in the Continental U.S. and Alaska. Types designated East/West are commonly found in those regions, although types designated for one region may occasionally be found in another. These codes are used for FOREST TYPE (Item 5.7.1.9).

East	West	Code	Species Type
White / Red / Jack Pine Group			
E		101	**Jack pine**
E		102	**Red pine**
E		103	**Eastern white pine**
E		104	**Eastern white pine / eastern hemlock**
E		105	**Eastern hemlock**
Spruce / Fir Group			
E		121	**Balsam fir**
E		122	**White spruce**
E		123	**Red spruce**
E		124	**Red spruce / balsam fir**
E	W	125	**Black spruce**
E		126	**Tamarack**
E		127	**Northern white-cedar**
E		128	**Fraser fir**
E		129	**Red spruce / Fraser fir**
Longleaf / Slash Pine Group			
E		141	**Longleaf pine**
E		142	**Slash pine**
Tropical Softwoods Group			
E		151	**Tropical pines**
Loblolly / Shortleaf Pine Group			
E		161	**Loblolly pine**
E		162	**Shortleaf pine**
E		163	**Virginia pine**
E		164	**Sand pine**
E		165	**Table-mountain pine**
E		166	**Pond pine**
E		167	**Pitch pine**
E		168	**Spruce pine**
Other Eastern Softwoods Group			
E		171	**Eastern redcedar**
E		172	**Florida softwoods**
Pinyon / Juniper Group			
E	W	182	**Rocky Mountain juniper**
E	W	184	**Juniper woodland**
E	W	185	**Pinyon-juniper woodland**
Douglas-fir Group			
E	W	201	**Douglas-fir**
	W	202	**Port-Orford-cedar**
	W	203	**Bigcone Douglas-fir**
Ponderosa Pine Group			
E	W	221	**Ponderosa pine**
	W	222	**Incense-cedar**
	W	224	**Sugar pine**
	W	225	**Jeffrey pine**

East	West	Code	Species Type
	W	226	**Coulter pine**
Western White Pine Group			
	W	241	**Western white pine**
Fir / Spruce / Mountain Hemlock Group			
	W	261	**White fir**
	W	262	**Red fir**
	W	263	**Noble fir**
	W	264	**Pacific silver fir**
	W	265	**Engelmann spruce**
	W	266	**Engelmann spruce / subalpine fir**
	W	267	**Grand fir**
	W	268	**Subalpine fir**
	W	269	**Blue spruce**
	W	270	**Mountain hemlock**
	W	271	**Alaska-yellow-cedar**
Lodgepole Pine Group			
	W	281	**Lodgepole pine**
Hemlock / Sitka Spruce Group			
	W	301	**Western hemlock**
	W	304	**Western red cedar**
	W	305	**Sitka spruce**
Western Larch Group			
	W	321	**Western larch**
Redwood Group			
	W	341	**Redwood**
	W	342	**Giant sequoia**
Other Western Softwoods Group			
	W	361	**Knobcone pine**
	W	362	**Southwestern white pine**
	W	363	**Bishop pine**
	W	364	**Monterey pine**
	W	365	**Foxtail pine / bristlecone pine**
	W	366	**Limber pine**
	W	367	**Whitebark pine**
	W	368	**Misc. western softwoods**
	W	369	**Western juniper**
California Mixed Conifer Group			
	W	371	**California mixed conifer**
Exotic Softwoods Group			
E		381	**Scotch pine**
E	W	383	**Other exotic softwoods**
E		384	**Norway spruce**
E		385	**Introduced larch**
Other Softwoods Group			
		391	**Other softwoods**
Oak / Pine Group			
E		401	**Eastern white pine / N. red oak / white ash**
E		402	**Eastern redcedar / hardwood**
E		403	**Longleaf pine / oak**
E		404	**Shortleaf pine / oak**
E		405	**Virginia pine / southern red oak**
E		406	**Loblolly pine / hardwood**
E		407	**Slash pine / hardwood**
E		409	**Other pine / hardwood**
Oak / Hickory Group			

East	West	Code	Species Type
E		501	**Post oak / blackjack oak**
E		502	**Chestnut oak**
E		503	**White oak / red oak / hickory**
E		504	**White oak**
E		505	**Northern red oak**
E		506	**Yellow-poplar / white oak / N. red oak**
E		507	**Sassafras / persimmon**
E		508	**Sweetgum / yellow-poplar**
E		509	**Bur oak**
E		510	**Scarlet oak**
E		511	**Yellow-poplar**
E		512	**Black walnut**
E		513	**Black locust**
E		514	**Southern scrub oak**
E		515	**Chestnut oak / black oak / scarlet oak**
E		516	**Cherry / white ash / yellow-poplar**
E		517	**Elm / ash / black locust**
E		519	**Red maple / oak**
E		520	**Mixed upland hardwoods**
Oak / Gum / Cypress Group			
E		601	**Swamp chestnut oak / cherrybark oak**
E		602	**Sweetgum / Nuttall oak / willow oak**
E		605	**Overcup oak / water hickory**
E		606	**Atlantic white-cedar**
E		607	**Baldcypress / water tupelo**
E		608	**Sweetbay / swamp tupelo / red maple**
E		609	**Baldcypress / pondcypress**
Elm / Ash / Cottonwood Group			
E		701	**Black ash / American elm / red maple**
E		702	**River birch / sycamore**
E	W	703	**Cottonwood**
E	W	704	**Willow**
E		705	**Sycamore / pecan / American elm**
E		706	**Sugarberry / hackberry / elm / green ash**
E		707	**Silver maple / American elm**
E		708	**Red maple / lowland**
E	W	709	**Cottonwood / willow**
	W	722	**Oregon ash**
Maple / Beech / Birch Group			
E		801	**Sugar maple / beech / yellow birch**
E		802	**Black cherry**
E		805	**Hard maple / basswood**
E		809	**Red maple / upland**
Aspen / Birch Group			
E	W	901	**Aspen**
E	W	902	**Paper birch**
E		903	**Gray birch**
E	W	904	**Balsam poplar**
E	W	905	**Pin cherry**
Alder / Maple Group			
	W	911	**Red alder**
	W	912	**Bigleaf maple**
Western Oak Group			
	W	921	**Gray pine**
	W	922	**California black oak**

East	West	Code	Species Type
	W	923	**Oregon white oak**
	W	924	**Blue oak**
	W	931	**Coast live oak**
	W	933	**Canyon live oak**
	W	934	**Interior live oak**
	W	935	**California white oak (valley oak)**
Tanoak / Laurel Group			
	W	941	**Tanoak**
	W	942	**California laurel**
	W	943	**Giant chinkapin**
Other Harwoods Group			
	W	961	**Pacific madrone**
	W	962	**Other hardwoods**
Woodland Hardwoods Group			
	W	971	**Deciduous oak woodland**
	W	972	**Evergreen oak woodland**
	W	973	**Mesquite woodland**
	W	974	**Cercocarpus (Mountain brush) woodland**
	W	975	**Intermountain maple woodland**
	W	976	**Misc. woodland hardwoods**
Tropical and Hardwood Groups			
E		982	**Mangrove**
E	W	983	**Palms**
		984	**Dry forest**
		985	**Moist forest**
		986	**Wet and rain forest**
		987	**Lower montane wet and rain forest**
		988	**Cloud forest**
E		989	**Other tropical hardwoods**
Exotic Hardwoods Group			
E		991	**Paulownia**
E		992	**Melaleuca**
E	W	993	**Eucalyptus**
E	W	995	**Other exotic hardwoods**

For nonstocked stands, see *FOREST TYPE (Item 5.7.1.9)* for procedures to determine FOREST TYPE.

SECTION E.2 FOREST TYPE DESCRIPTIONS

SUBSECTION E.2.1 PINYON / JUNIPER GROUP

- 182 Rocky Mountain juniper: Rocky Mountain juniper comprises the majority of stocking. Associates - ponderosa pine, Douglas-fir, other junipers, pinyons, and oaks. Sites -- often found on calcareous and somewhat alkaline soils.
- 184 Juniper woodland: Includes Pinchot juniper, redberry juniper, Ashe juniper, California juniper, alligator juniper, Utah juniper, oneseed juniper and pinyon is NOT present. Associates: various woodland oaks and cercocarpus, ponderosa pine, Arizona cypress, and Douglas-fir. Sites -- lower elevation with low annual precipitation.
- 185 Pinyon-juniper woodland: Includes all pinyons and all junipers except Rocky Mountain and western juniper. Must have pinyon present. Associates: various woodland oaks and cercocarpus, ponderosa pine, Arizona cypress, and Douglas-fir. Sites--occurs at lower elevations with low annual precipitation.

SUBSECTION E.2.2 DOUGLAS-FIR GROUP

- 201 Douglas-fir: Associates - western hemlock, grand fir, Pacific silver fir, white fir, noble fir, California red fir, western redcedar, bigleaf maple, red alder, ponderosa pine, western white pine, western hemlock, Sitka spruce. Sites -- throughout the western U.S.
- 202 Port-Orford-cedar: Associates - Douglas-fir, western hemlock, Sitka spruce, grand fir, lodgepole pine, western redcedar, redwood, tanoak, red alder, bigleaf maple and California laurel. Sites --higher elevations tending to occur on northerly aspects.
- 203 Bigcone Douglas-fir: Associates - Canyon live oak, ponderosa, Jeffrey, sugar, knobcone, and Coulter pines, incense-cedar, white fir, California black oak, California laurel, and bigleaf maple. Sites -- Mainly confined to the Transverse and Peninsular Ranges of southern California. Stands are found on many combinations of slope, aspect, soil, but as elevations increase, the preferred aspect shifts from cooler to warmer slopes.

SUBSECTION E.2.3 PONDEROSA PINE GROUP

- 221 Ponderosa pine (includes Arizona pine): Associates - Douglas-fir, lodgepole pine, grand fir, Jeffrey pine, western larch, quaking aspen, Utah juniper, Gambel oak. Sites -- this forest type is distributed over vast areas in the West and therefore can have great differences in environmental conditions.
- 222 Incense-cedar: Associates - Douglas-fir, ponderosa pine, sugar pine, western white pine, Jeffrey pine, white and grand fir, western hemlock, western redcedar, Port-Orford-cedar, giant sequoia, Oregon white oak, California black oak, tanoak, giant chinkapin, and Pacific madrone; it is rarely found in pure stands. Sites -- Grows from the coastal fog belt to the dry inland slopes of eastern California and central Oregon. Once established, incense-cedar is a good competitor on hot, dry sites and commonly shares an upper canopy position on southwestern slopes. On cooler, moister aspects, it is usually subdominant to other species.
- 224 Sugar pine: Associates - In the northern part of its range: Douglas-fir, ponderosa pine, grand fir, incense-cedar, western hemlock, western redcedar, Port-Orford-cedar, tanoak, and madrone. In the central part of its range: ponderosa pine, Jeffrey pine, white fir, incense-cedar, California red fir, giant sequoia, and California black oak. Farther south: Jeffrey pine, ponderosa pine, Coulter pine, incense-cedar, white fir, and bigcone Douglas-fir. Sites -- grows in areas that have warm, dry summers and cool, wet, mild winters. Terrain is commonly steep and rugged, favoring warm exposures as the elevation increases. Found in Oregon and California, but is most abundant in the mixed conifer forests on the west slope of the Sierra Nevada.
- 225 Jeffrey pine: Associates - Incense-cedar, ponderosa pine, sugar pine, Douglas-fir, Port-Orford-cedar, western white pine, knobcone pine, gray pine, red and white fir. Sites -- thrives in fairly harsh environments throughout most of its range, and is cold hardy, drought tolerant, adapted to short growing seasons, and tolerant of infertile sites. The majority of trees are found in California, although its range extends into SW Oregon and western Nevada.
- 226 Coulter pine: Associates - blue oak, California black oak, interior live oak, coast live oak, valley oak, California scrub oak, buckeye, ponderosa pine. Sites -- grows singly or in small stands primarily on dry, rocky slopes of southern California coastal ranges, between 3,000 and 6,000 feet. Occurs from Mt. Diablo and the Santa Lucia Mountains down to the San Bernardino, San Jacinto, and Cuyamaca Mountains in the south.

SUBSECTION E.2.4 WESTERN WHITE PINE GROUP

- 241 Western white pine: Associates - western larch, grand fir, western redcedar, and western hemlock. Sites -- occurs primarily on moist, mid-elevation sites from 1,500 to 4,000 feet.

SUBSECTION E.2.5 FIR/SPRUCE/MOUNTAIN HEMLOCK GROUP

- 261 White fir: Associates - Douglas-fir, sugar pine, ponderosa pine, Jeffrey pine, incense-cedar, California red fir, blue spruce, limber pine, and aspen. Sites -- deep well-drained sandy loam-covered slopes and benches with a northerly exposure.
- 262 Red fir (includes California and Shasta red fir): Associates - Jeffrey pine, western white pine, lodgepole pine, mountain hemlock, and sugar pine. Sites -- found at elevations ranging from 5,400 to 7,500 feet.

- 263 Noble fir: Associates - Douglas-fir, Pacific silver fir, western and mountain hemlocks, lodgepole pine, western redcedar, and Alaska cedar. Sites -- found on a variety of sites where precipitation is high and snowpacks are common, generally above 3,000 feet in elevation in the Cascade and Coast ranges.
- 264 Pacific silver fir: Associates - western and mountain hemlocks, western redcedar, Alaska cedar, grand fir, Sitka spruce, lodgepole pine, subalpine fir, and Engelmann spruce. Sites -- most abundant on sites where summer drought is minimal and snowpacks are common, such as areas of heavy rainfall, seepage, or prolonged snowmelt.
- 265 Engelmann spruce: Associates - western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, subalpine fir, and lodgepole pine. For this type to be used, the total stocking of Engelmann spruce must be at least 75 percent of the total stocking.
- 266 Engelmann spruce-subalpine fir: Associates - western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, and lodgepole pine. Sites -- this type is widespread in the Western U.S. For this type to be used, the sum of the stocking of Engelmann spruce and subalpine fir must be at least 75 percent of the total stocking and Engelmann spruce stocking must be between 5 and 74 percent of total and subalpine fir stocking must be between 5 and 74 percent of total.
- 267 Grand fir: Associates - ponderosa pine, Douglas-fir, western hemlock, western redcedar, western white pine, Pacific yew, lodgepole pine, and western larch. Sites -- in Idaho, found on moist slopes from 1,500 to 5,200-foot elevations; in Oregon, it occupies moist low-elevation sites, but also extends up to mid-elevations to as high as 6,000 feet.
- 268 Subalpine fir: Associates - western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, Engelmann spruce, and lodgepole pine. For this type to be used, the total stocking of subalpine fir must be at least 75 percent of the total stocking. Sites -- found at high elevations, near timberline.
- 269 Blue spruce: Associates - Douglas-fir, ponderosa pine, white fir, lodgepole pine, and Rocky Mountain juniper. Sites -- restricted to the southern Rocky Mountains, typically located in the montane zone.
- 270 Mountain hemlock: Associates - Alaska-cedar, Pacific silver fir, western white pine, lodgepole pine, noble fir, and subalpine fir. Sites -- occurs in cold, moist regions and growing conditions are poor.
- 271 Alaska-yellow-cedar: Associates: In California, California red fir, Brewer spruce, incense-cedar, Pacific yew, and western white pine; in Oregon and Washington, found with mountain hemlock, subalpine fir, Pacific silver fir, noble fir, western white pine, and western hemlock. Sites -- Cool and humid climate, most stands grow within 100 miles of the Pacific coast.

SUBSECTION E.2.6 LODGEPOLE PINE GROUP

- 281 Lodgepole pine: Associates - subalpine fir, Engelmann spruce, white spruce, Douglas-fir, western redcedar, red alder, and western hemlock. Sites -- one of the most widespread types in the Western U.S. tolerating a broad range of temperature and moisture regimes.

SUBSECTION E.2.7 HEMLOCK/SITKA SPRUCE GROUP

- 301 Western hemlock: Associates - Sitka spruce, western redcedar, Douglas-fir, Alaska-yellow-cedar, grand fir, Engelmann spruce, bigleaf maple, and red alder. Sites -- nearly any soil provides a seedbed but requires abundant moisture. Often comes in cut-over or burned-over areas.
- 304 Western redcedar: Associates - western white pine, western hemlock, western larch, grand fir, Douglas-fir, and Pacific silver fir. Sites -- inhabits moist flats and slopes, the banks of rivers and swamps and can be found in bogs.
- 305 Sitka spruce: Associates - western hemlock, Douglas-fir, western redcedar, Port Orford-cedar, red alder, bigleaf maple, and black cottonwood. Sites - -limited to a relatively narrow oceanside strip characterized by mild winters, cool summers, and abundant moisture throughout the growing season.

SUBSECTION E.2.8 WESTERN LARCH GROUP

- 321 Western larch: Associates - Douglas-fir, subalpine fir, lodgepole pine, Engelmann spruce, western hemlock, and western redcedar. Sites -- best growth on deep, moist, porous soils in high valleys and on mountain slopes of northern and western exposure.

SUBSECTION E.2.9 REDWOOD GROUP

- 341 Redwood: Associates - Douglas-fir, grand fir, western hemlock, California torreya, Pacific yew, and western redcedar. Sites -- largely confined to coastal topography between 35 degrees 41 minutes and 42 degrees 9 minutes north latitude.
- 342 Giant sequoia: Associates: California white fir, sugar pine, incense-cedar, California red fir, California white fir, ponderosa pine and California black oak. Sites -- Deep, well-drained soils with high soil moisture available during dry summers. Most stands found above 4,000 feet elevation, rarely forming pure stands.

SUBSECTION E.2.10 OTHER WESTERN SOFTWOODS GROUP

- 361 Knobcone pine: Associates - Gray pine, canyon live oak and many western oaks, Douglas-fir, and Port Orford-cedar. Sites -- found on soils that are shallow, dry, stony or high in magnesium.
- 362 Southwestern white pine: Associates- Douglas-fir, white fir, ponderosa pine, Gambel oak, and aspen. Sites -- higher elevations in Arizona and New Mexico
- 363 Bishop pine: Grows singly or in small stands along the coast of California.
- 364 Monterey pine: Grows singly or in small stands. Sites -- Native stands are found in the high humidity and summer fogs of the central-coast area of California in San Mateo, Santa Cruz, Monterey, and San Luis Obispo Counties.
- 365 Foxtail pine/bristlecone pine: Associates - limber pine, white fir, Engelmann spruce, ponderosa pine, and pinyon. Sites -- found on rocky outcrops, usually on southern or southwestern exposures and can range in elevation from 8,000 to 11,000 feet.
- 366 Limber pine: Associates - low to mid elevations.: Douglas-fir, ponderosa pine, Rocky Mountain juniper; mid to high elevations: lodgepole pine and aspen; high elevations: Engelmann spruce, subalpine fir, bristlecone pine, and whitebark pine. Sites -- a very wide range of elevations and latitudes across the Rocky mountains; can be the majority species as an early seral stage under a variety of harsh establishment conditions, as climax in dry, high elevation sites in the central and southern Rockies.
- 367 Whitebark pine: Associates - subalpine fir, subalpine larch, Engelmann spruce, and lodgepole pine. Sites -- poor, high elevation.
- 368 Miscellaneous western softwoods: A "catch-all" group for such species as all cypress (Cupressus) species, subalpine larch, Brewer spruce, Apache pine, Chihuahua pine, Washoe pine, Torrey pine, Pacific yew, and California torreya.
- 369 Western juniper: Associates - ponderosa pine and Jeffrey pine. Sites -- found on dry sites and ranges in elevation from just above sea level to 6,500 feet.

SUBSECTION E.2.11 CALIFORNIA MIXED CONIFER GROUP

- 371 California mixed conifer: Associates - defined only for plots in California (STATE = 06), typically a mixture of several conifer species occurring as single trees or small groups, sometimes with a broad range of heights, in which any of ponderosa pine, Jeffrey pine, sugar pine, Douglas-fir, white fir, red fir, Shasta red fir and incense-cedar may predominate. In some cases, only one species is present (as implied by rules 1 and 2 below). The type is often found on, but not limited to, east-facing slopes of the Coast Range and on the west-facing and higher elevation east facing slopes of the Cascades and Sierra Nevada.

  Formal rules - to classify as a mixed conifer forest type, the condition class must be capable of being stocked with 70-percent conifers and one of the following must be true (only applicable in California (STATE = 06):

  1. Douglas-fir predominates and the COUNTY is not Del Norte (015), Humboldt (023), Marin (041), Mendocino (045), Napa (055), San Mateo (081), Santa Clara (085), Santa Cruz (087), or Sonoma (097).
  2. Sugar pine (117) or incense cedar (081) predominates.
  3. Ponderosa pine (122) and/or Jeffrey pine (116), either singly or in combination, predominate but make up less than 80-percent of the conifer stocking.
  4. White fir (015), and/or red fir (020) and/or Shasta red fir (021) either singly or in combination predominate, but make up less than 80-percent of the conifer stocking.

SUBSECTION E.2.12 OTHER SOFTWOODS GROUP

- 391 Other softwoods: All softwood species identified to genus level only, except cypress, baldcypress, and larch.

SUBSECTION E.2.13 ELM/ASH/COTTONWOOD GROUP

- 703 Cottonwood: Associates - willow, white ash, green ash, and sycamore. Sites - streambanks where bare, moist soil is available.
- 704 Willow (includes peachleaf and black willow): Associates - cottonwood, green ash, sycamore, pecan, American elm, red maple, and boxelder. Sites - streambanks where bare, moist soil is available.
- 709 Cottonwood/willow (includes peachleaf, black and Bebb willow): Associates - white ash, green ash, sycamore, American elm, red maple and boxelder. Sites -- stream banks where bare, moist soil is available.
- 722 Oregon ash: Associates - red alder, bigleaf maple, black cottonwood, willow. Sites -- riparian areas, prefers damp, loose soils, below 3000 feet.

SUBSECTION E.2.14 ASPEN/BIRCH GROUP

- 901 Aspen: Associates - Engelmann spruce, lodgepole pine, ponderosa pine, Douglas-fir, subalpine fir, white fir, white spruce, balsam poplar, and paper birch. Sites -- aspen has the capacity to grow on a variety of sites and soils, ranging from shallow stony soils and loamy sands to heavy clays.
- 902 Paper birch (includes northern paper birch): Associates - aspen, white spruce, black spruce, and lodgepole pine. Sites -- can be found on a range of soils, but best developed on well-drained sandy loam and silt loam soils.

SUBSECTION E.2.15 ALDER/MAPLE GROUP

- 911 Red alder: Associates - Douglas-fir, western hemlock, western redcedar, grand fir, Sitka spruce, black cottonwood, bigleaf maple, willow. Sites -- stream bottoms and lower slopes, west of the Cascades, usually within 125 miles of the coast, below 2,400 feet.
- 912 Bigleaf maple: Associates - Douglas-fir, western hemlock, western redcedar, black cottonwood, Pacific madrone, Pacific dogwood, red alder. Sites -- Flat interior valleys, gently sloping stream bottoms, and moderate to steep slopes; favors moist, well-drained soils of river terraces and flood plains, but also grows on drier rocky, south-facing slopes in the Coast Ranges of northwestern Oregon.

SUBSECTION E.2.16 WESTERN OAK GROUP

- 921 Gray pine: Associates - Blue oak, California black oak, interior live oak, coast live oak, valley oak, California scrub oak, buckeye, western juniper, Coulter pine. Sites -- dry foothill woodland communities of California's Central Valley, on rocky slopes and steep canyon walls below 3,000 feet. Prefers areas with hot, dry summers and absence of summer fog. Tolerates infertile, low moisture soils.
- 922 California black oak: Associates - ponderosa pine, Douglas-fir, incense-cedar, knobcone pine, Pacific madrone, tanoak, and Oregon white oak.
- 923 Oregon white oak: Associates - Douglas-fir, bigleaf maple, and Oregon ash. Sites -- commonly occurs in very moist locations, in mixture with Oregon ash on floodplains of the Willamette Valley, and on poorly drained heavy clay soils.
- 924 Blue oak: Associates - Gray pine, interior live oak, canyon live oak, valley oak, and California buckeye. Sites -- low valleys and foothills of the Coast Ranges and Sierras in California.
- 931 Coast live oak: Associates - knobcone pine, Monterey pine, interior live oak, valley oak, blue oak, tanoak, Pacific madrone, and California laurel. Sites -- usually occupies well-drained soils.
- 933 Canyon live oak: Associates - Douglas-fir, bigcone Douglas-fir, ponderosa pine, Jeffrey pine, bigleaf maple, Pacific madrone, and California laurel. Sites -- found on steep rocky canyon slopes and boulder-filled bottoms.
- 934 Interior live oak: Associates - Blue oak, coast live oak, valley oak, canyon live oak, gray pine, ponderosa pine, Douglas-fir. Sites -- from valleys to foothills, below 5,000 feet; grows on moister sites than blue oak.

- 935 California white oak (valley oak): Associates - Canyon live oak, coast live oak, California black oak, blue oak, California buckeye, gray pine, ponderosa pine. Sites -- hot interior valleys and slopes below 2,000 feet; tolerates cool wet winters and hot dry summers; prefers fertile soils of valley floors.

SUBSECTION E.2.17 TANOAK/LAUREL GROUP

- 941 Tanoak: Associates - Douglas-fir, Pacific madrone, and canyon live oak. Sites -- sea level to 5,000 feet elevation from southern Oregon south along the Coast Ranges to the Santa Ynez Mountains in California.
- 942 California laurel: Associates - usually found in mixed stands with a wide variety of associated species. Sites -- from the cool, humid conditions of dense coastal forests to hot, dry sites found inland in open woodlands and chaparral, below 4,000 feet.
- 943 Giant chinkapin: Associates - rarely grows in pure stands, usually a component of other types. Found with Douglas-fir, western hemlock, incense-cedar, white fir, western white pine, sugar pine, ponderosa pine, Pacific madrone, tanoak, and California black oak. Sites -- from valley bottoms to ridgetops, in the coast and cascade ranges, below 5,000 feet. Tolerates infertile and droughty sites.

SUBSECTION E.2.18 OTHER HARDWOODS GROUP

- 961 Pacific madrone: Associates - a wide variety of species, but most common with Douglas-fir and tanoak. Sites -- grows on all aspects but is found most often on those facing south and west, and tolerates low soil moisture in summer
- 962 Other hardwoods: A "catch-all" group for hardwood species identified only to the genus level, with the exception of the following species (Note: This code primarily applies to a mapped subplot, where only one or two "uncommon" tree species are tallied): hackberry spp., hawthorn spp., eucalyptus spp., persimmon spp., magnolia spp., mulberry spp., mesquite spp., citrus spp., royal palm spp., willow spp., and saltcedar spp., AND striped maple, mountain maple, California buckeye, Arizona alder, serviceberry, Arizona madrone, pawpaw, sweet birch, Virginia roundleaf birch, Allegany chinkapin, Ozark chinkapin, southern catalpa, northern catalpa, yellowwood, Pacific dogwood, pumpkin ash, blue ash, velvet ash, Carolina ash, Texas ash, all silverbells, California black walnut, southern California black walnut, Texas walnut, Arizona walnut, all apple species, eastern hophornbeam, California sycamore, Arizona sycamore, chokecherry, peach, Canada plum, wild plum, bitter cherry, Allegheny plum, Chickasaw plum, sweet cherry, sour cherry, European plum, Mahaleb plum, western soapberry, American mountain-ash, northern mountain-ash, Joshua tree, smoketree, great leucaena, and berlandier ash.

SUBSECTION E.2.19 WOODLAND HARDWOODS GROUP

- 971 Deciduous oak woodland: areas with predominantly Gambel oak, which is often associated with ponderosa pine, white fir, Douglas-fir, alligator juniper, bigtooth maple, and chokecherry. Sites -- most soils, on elevations generally ranging from 4,000 to 8,000 feet.
- 972 Evergreen oak woodland: areas with predominantly evergreen oaks, such as Arizona white oak, Emory oak, Engelmann oak, Mexican blue oak, silverleaf oak, gray oak and/or netleaf oak. Other associates - various pinyons and junipers. Sites -- alluvial soils, from 4,000 to 7,500 feet elevation.
- 973 Mesquite woodland: Honey mesquite and screwbean mesquite comprise the majority of the stocking of this cover type. Honey mesquite associates, which are many, vary with climate and soils. Sites -- occurs on a wide variety of soils at elevations mostly below 5,000 feet.
- 974 Cercocarpus (Mountain brush) woodland (includes curlleaf mountain-mahogany): Associates - Rocky Mountain juniper, big sagebrush, and snowberry. Sites -- dry, course-textured soils.
- 975 Intermountain maple woodland (includes Rocky Mountain and/or bigtooth maple): Associates - chokecherry, boxelder, birchleaf mountain-mahogany, and Gambel oak. Sites -- most soils but does not tolerate long flooding periods. Found growing between 4,500 and 7,500 feet elevation.
- 976 Miscellaneous woodland hardwoods [includes acacia, New Mexico locust, and/or Arizona ironwood (tesota)]. Sites - occurs on a wide variety of soils at elevations mostly below 5,000 feet.

APPENDIX F TREE CODING GUIDE

SECTION F.1 TREE CODING GUIDE

Trees less than 5.0 inches and at least 1.0 inch in diameter are only measured on the microplot and trees 5.0 inches and greater in diameter are measured across the entire subplot /macroplot. Macroplot breakpoint diameter is defined by regional guidelines.

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
	SAMPLE KIND 1 or 3						
1		Live 1.0+ DBH/DRC	-	1			
2		Standing dead 1.0+ DBH/DRC	-	2		Null – Office inserts code 1	Core optional
	SAMPLE KIND 2 (Remeasure) Changes in Present Tree Status, Diameter or Location from Microplot to Subplot						
3	Live 5.0+ DBH/DRC	Live 5.0+ DBH/DRC	1	1			
4	Live 1.0-4.9 DBH/DRC on microplot	Live 5.0+ DBH/DRC Note: this live tally tree should be referenced with a new distance and azimuth from the subplot center.	1	1			
5	Live 1.0-4.9 DBH/DRC on microplot	Live 1.0-4.9 DBH/DRC on microplot	1	1			
6	Live 1.0+ micro/5.0+ subplot DBH/DRC	Standing dead 5.0+ DBH/DRC	1	2		1	10-80
7	Live 5.0+ DBH/DRC	Down dead 5.0+ DBH/DRC	1	2		0	10-80
8	Live 1.0-4.9 DBH/DRC on microplot	Dead 5.0+ DBH/DRC (standing or down) Note: if standing, this dead tally tree should be referenced with a new distance and azimuth from the subplot center.	1	2		0 or 1	10-80
9	Live 1.0+ micro/5.0+ subplot DBH/DRC	Cut and left in the woods	1	2		0	80
10	Live 1.0+ micro/5.0+ subplot DBH/DRC	Tree removed (cut and hauled away)	1	3			80
11	Dead 5.0+ DBH/DRC	Dead standing 5.0 DBH/DRC	2	2		1	
12	Dead 5.0+ DBH/DRC	Dead down 5.0+ DBH/DRC	2	2		0	
13	Dead 5.0+ DBH/DRC	Tree removed (cut and hauled away)	2	3			

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
14	< 5.0 live DBH/DRC	5.0+ DBH/DRC live (not on the microplot)		1	1		
15	< 1.0 live DBH/DRC	1.0-4.9 DBH/DRC live (on the microplot)		1	1		
16	< 1.0 live DBH/DRC	Standing dead 1.0-4.9 DBH/DRC on microplot	1	2	1	1	10-80
17	< 1.0 live DBH/DRC	5.0+ DBH/DRC live (through growth on the microplot)		1	2		
18	< 5.0 live DBH/DRC	5.0+ DBH/DRC dead (standing, not on the microplot)	1	2	1	1	10-80
19	< 5.0 live DBH/DRC	5.0+ DBH/DRC dead (standing or down, on the microplot)	1	2		0 or 1	10-80
	SAMPLE KIND 2 (Remeasure) Shrinking Diameter Scenarios						
20	Dead 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot)	2	2		0	
21	Dead 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead located on microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center	2	2		1	
22	Live 5.0+ DBH/DRC	Tree shrank <5.0 and live, NOT on microplot	1	0	5		
23	Live 5.0+ DBH/DRC	Live but shrank < 5.0 and on microplot Note: this live sapling should be referenced with a new distance and azimuth from the microplot center.	1	1			
24	Live 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot)	1	2		0	10-80
25	Live 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead located on microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center	1	2		1	10-80
26	Live 1.0-4.9 DBH/DRC	Tree shrank <1.0 and live	1	0	5		
27	Live 1.0 – 4.9 DBH/DRC	Tree shrank <1.0 and dead	1	2		0	10-80
	SAMPLE KIND 2 (Remeasure) Trees Moving On or Off Subplots and Microplots						

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
28	Live 1.0+ micro/5.0+ subplot DBH/DRC	Tree moved off plot/microplot due to a geologic (e.g., slight earth movement) or weather event (e.g., hurricane) and you can still see it (live before, live now)	1	0	6		
29	Live 1.0+ micro/5.0+ subplot DBH/DRC	Cruiser unable to locate tree due to a weather, geologic (such as landslide), or fire event & assume tree is down dead **or** you can see tree is dead and down, and off the plot	1	2		0	30 or 50
30	Dead 5.0 DBH/DRC	Tree moved off plot due to a geologic (e.g., small earth movement) or weather event (e.g., hurricane) and you can still see the tree is standing dead	2	0	6		
31	Dead 5.0+ DBH/DRC	Cruiser is unable to locate tree due to a weather, geologic (such as landslide), or fire event & assume it is down dead or you can see tree and it is down dead and off the plot	2	2		0	
32	No status	Live tree moved onto plot due to a geologic (e.g. small earth movement) or weather event (e.g. hurricane)		1	6		
33	No Status	Previously live tree moved onto plot due to a geologic (e.g. small earth movement) or weather event (e.g. hurricane) and now dead	1	2	6	1	10-80
34	No Status	Previously dead tree moved onto plot due to a geologic (e.g. small earth movement) or weather event (e.g. hurricane)	2	2	6	1	
	SAMPLE KIND 2 (Remeasure) Added or Missed Trees and Cruiser Error						
35	Live 1.0-4.9 DBH/DRC	Live 1.0-4.9 DBH/DRC, shouldn't have been tallied—beyond 6.8—cruiser error	1	0	7		
36	Live or dead 5.0+ DBH/DRC	Live or dead 5.0+ DBH/DRC, shouldn't have been tallied –beyond 24.0—cruiser error	1 or 2	0	7		
37	Live or dead 24.0/30.0+ DBH/DRC	Live or dead 24.0/30.0+ DBH/DRC, shouldn't have been tallied–beyond 58.9—cruiser error	1 or 2	0	7		
38	Live 1.0+ micro/5.0+ subplot DBH/DRC	Live 1.0+ micro/5.0+ subplot DBH/DRC, shouldn't have been tallied—not a tally species—cruiser error	1	0	7		
39	Dead 5.0+ DBH/DRC	Dead 5.0+ DBH/DRC, shouldn't have been tallied—not a tally species—cruiser error	2	0	7		

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
40	Live 1.0+ micro/5.0+ subplot DBH/DRC	Live 1.0+ micro/5.0+ subplot DBH/DRC, shouldn't have been tallied-area was not forestland or measurable nonforest at previous inventory-cruiser error	1	0	7		
41	Dead 5.0+ DBH/DRC	Dead 5.0+ DBH/DRC, shouldn't have been tallied - area was not forestland or measurable nonforest at previous inventory -cruiser error	1 or 2	0	7		
42	No Status	Live 1.0+ micro/5.0+ subplot DBH/DRC, should have been tallied—was a tally species—cruiser error		1	7		
43	No Status	Dead 5.0+ DBH/DRC, should have been tallied—was a tally species previously alive—cruiser error	1	2	7	1	10-80
44	No Status	Dead 5.0+ DBH/DRC, should have been tallied—was a tally species previously standing dead—cruiser error	2	2	7	1	
	SAMPLE KIND 2 (Remeasure) Tally Species Change						
45	Live 1.0+ DBH/DRC	No longer a tally species (alive or dead)	1	0	8		
46	Dead 5.0+ DBH/DRC	No longer a tally species	2	0	8		
47	No Status	Live tree now on tally tree species list		1	8		
48	No Status	Standing Dead tree now on tally tree species list and previously alive	1	2	8	1	10-80
49	No Status	Standing Dead tree now on tally tree species list and previously dead	2	2	8	1	
	SAMPLE KIND 2 (Remeasure) Forest and Nonforest Land Changes						
50	Live 1.0+	Live tree status but land no longer qualifies as forest	1	1			
51	Live 1.0 + DBH/DRC	Dead (standing or down) and land no longer qualifies as forest (land clearing or conversion to nonforest land use)	1	2		0 or 1	10-80
52	Live 1.0+ DBH/DRC	Gone (cut and removed) and land no longer qualifies as forest	1	3			80
53	Nonforest before, <1.0 live DBH/DRC	Natural or artificial conversion to forest, Standing Dead 1.0+ DBH/DRC	1	2	1	1	10-80
54	Nonforest before, Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	Natural or artificial conversion to forest, Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	2	2	1	1	
55	Nonforest before, <1.0 live micro/<5.0 subplot DBH/ DRC	Forest now due to forestland definition changes (master species list, stocking to cover), Live 1.0+ micro/5.0+ subplot DBH/DRC	1	1	8		

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
56	Nonforest before, Live 1.0+ micro/5.0+ subplot DBH/ DRC	Forest now due to forestland definition changes (master species list, stocking to cover), Live 1.0+ micro/5.0+ subplot DBH/DRC	1	1	8		
57	Nonforest before, Live 1.0+ micro/5.0+ subplot DBH/ DRC	Forest now due to forestland definition changes (master species list, stocking to cover), Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	1	2	8	1	10-80
58	Nonforest before, Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	Forest now due to forestland definition changes (master species list, stocking to cover), Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	2	2	8	1	
	SAMPLE KIND 2 (Remeasure) Plots with Nonforest Inventories (NONFOREST SAMPLING STATUS = 1)						
59	Non-measurable nonforest before, <1.0 live DBH/DRC	Measurable nonforest now, Live 1.0+ DBH/DRC		1	8		
60	Non-measurable nonforest before, 1.0+ live micro/5.0+ subplot DBH/DRC	Measurable nonforest now, Live 1.0+ micro/5.0+ subplot DBH/DRC		1	8		
61	Non-measurable nonforest before (tree was previously alive)	Measurable nonforest now, Standing Dead 1.0+ micro/ 5.0+ subplot DBH/DRC	1	2	8	1	10-80
62	Non-measurable nonforest before (tree was previously dead)	Measurable nonforest now, Standing Dead 1.0+ micro/ 5.0+ subplot DBH/DRC	2	2	8	1	
	SAMPLE KIND 2 (Remeasure) Sampled and Nonsampled Changes						
63	Live 1.0+ micro/5.0+ subplot DBH/DRC	Nonsampled area now	1	0	9		
64	Dead 5.0+ DBH/DRC	Nonsampled area now	2	0	9		
65	Nonsampled area before	Live 1.0 + micro/5.0+ subplot DBH/DRC		1	9		
66	Nonsampled area before (tree was previously alive)	Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	1	2	9	1	10-80
67	Nonsampled area before (tree was previously dead)	Standing Dead 1.0+ micro/5.0+ subplot DBH/DRC	2	2	9	1	
	WITNESS Changes						
68	Reference only (Witness only)	Witness stump is no longer used for any reason	7	0			
69	Reference Only (Witness Non-Tally Tree)	Witness Non-Tally Tree is no longer used for any reason	8	0			

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
70	Reference Only (Witness-Only Object)	Witness-Only Object is no longer used for any reason	9	0			
71	Reference Only (Witness Non-Tally Tree)	Live 1.0+ DBH/DRC	8	1	1		
72	Reference Only (Witness Non-Tally Tree)	Standing Dead 1.0+ DBH/DRC (previous tree status will need to be updated to 1 or 2)	8	2	1	1	

Note: After completion of 1 cycle with the new standing dead sapling protocols, additional tree coding combinations will be applicable.

APPENDIX G DAMAGE CODES

SECTION G.1 TREE DAMAGE REFERENCE INFORMATION

SUBSECTION G.1.1 DEFINITIONS

Merchantable Top - Defined by a 4inch diameter outside bark (DOB).

Length of Tree (Logs) - Defined by the number of 16 foot sections present on a tree from a 1 foot stump to a 4 inch DOB top.

Crook - An abrupt bend in a tree or log.

Sweep - A gradual and consistent deviation from a straight centerline. This is distinct from a leaning stem. The amount of sweep is measured as the deflection of the centerline of the log. Sweep is expressed as a proportion of the small end diameter.

Board Foot Defect - An estimate of the board foot volume lost due to a combination of form and cubic foot defect in sawtimber (softwood trees ≥ 9-inch DBH and hardwoods ≥ 11-inch DBH with a minimum of one 16 foot log with a merchantable top of 4 inches DOB).

SUBSECTION G.1.2 PERCENT DISTRIBUTION OF BOARD FOOT VOLUME

PERCENTAGE DISTRIBUTION OF BOARD FOOT TREE VOLUME BY 16' LOG TO 4" DOB TOP

TREE HEIGHT (logs)	LOG POSITION 1	2	3	4	5	6	7	8	9	10
1	100									
2	69	31								
3	52	33	15							
4	39	30	20	11						
5	33	26	20	13	8					
6	27	23	19	15	10	6				
7	24	29	17	14	11	8	6			
8	21	18	16	13	11	9	7	5		
9	19	16	14	12	11	9	8	6	5	
10	17	15	13	12	11	9	8	6	5	4

SECTION G.2 DAMAGE CODES

The REGION column means that only the region(s) listed are allowed to collect the specific code, and must do so when the damage is present and meets or exceeds the required threshold.

CODE	Common Name	Scientific Name	Threshold	REGION
0	**No Damage**			**ALL**
10000	**General Insects**		Any damage to the terminal leader; damage ≥ 20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	ALL
10001	thrips			

CODE	Common Name	Scientific Name	Threshold	REGION
10002	Pine tip moth			
10003	wasp			
10004	Chinese rose beetle	Adoretus sinicus		
10005	rose beetle	Adoretus versutus		
10006	coconut hispid beetle	Brontispa longissima		
10007	clerid beetle	Cleridae		
10008	weevil	Curculionidae		
10009	green rose chafer	Dichelonyx backi		
10010	Allegheny mound ant	Formica exsectoides		
10011	ant	Formicidae		
10012	stick insect	Graeffea crovanii		
10013	Hulodes cranea	Hulodes cranea		
10014	conifer swift moth	Korsheltellus gracilis		
10015	Caroline shortnosed weevil	Lophothetes spp.		
10016	coconut rhinoceros beetle	Oryctes rhinoceros	Any damage to the terminal leader; damage ≥ 20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	PNW
10017	bagworm moth	Psychidae	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
10018	coconut palm weevil	Rhobdoscelus asperipennis		
10019	scarab	Scarabaeidae		
10020	ash white fly	Siphoninus phillyreae		
10021	conifer seedling weevil	Steremnius carinatus		
10022	pyralid moth	Thliptoceras octoquttale		
10023	wood wasps	Siricidae spp.		
11000	**Bark Beetles**		Any evidence of a successful attack (successful attacks generally exhibit boring dust, many pitch tubes and/or fading crowns)	ALL
11001	roundheaded pine beetle	Dendroctonus adjunctus		
11002	western pine beetle	Dendroctonus brevicomis		
11003	southern pine beetle	Dendroctonus frontalis		
11004	Jeffrey pine beetle	Dendroctonus jeffreyi		
11005	lodgepole pine beetle	Dendroctonus murrayanae		
11006	mountain pine beetle	Dendroctonus ponderosae	Any evidence of a successful attack	IW; NRS
11007	Douglas-fir beetle	Dendroctonus pseudotsugae		
11008	Allegheny spruce beetle	Dendroctonus punctatus		
11009	spruce beetle	Dendroctonus rufipennis	Any evidence of a successful attack	IW; PNW
11010	eastern larch beetle	Dendroctonus simplex		
11011	black turpentine beetle	Dendroctonus terebrans		
11012	red turpentine beetle	Dendroctonus valens	Any evidence of a successful attack	SRS
11013	Dryocoetes affaber	Dryocoetes affaber		
11014	Dryocoetes autographus	Dryocoetes autographus		
11015	western balsam bark beetle	Dryocoetes confusus		
11016	Dryocoetes sechelti	Dryocoetes sechelti		
11017	ash bark beetles	Hylesinus spp.		
11018	native elm bark beetle	Hylurgopinus rufipes		
11019	pinon ips	Ips confusus		
11020	small southern pine engraver	Ips avulsus		
11021	sixspined ips	Ips calligraphus		
11022	emarginate ips	Ips emarginatus		
11023	southern pine engraver beetle	Ips grandicollis		
11024	Orthotomicus latidens	Orthotomicus latidens		
11025	Arizona five-spined ips	Ips lecontei		
11026	Monterey pine ips	Ips mexicanus		
11027	California fivespined ips	Ips paraconfusus		
11028	northern spruce engraver beetle	Ips perturbatus		
11029	pine engraver	Ips pini		
11030	Ips engraver beetles	Ips spp.	Any evidence of a successful attack	IW; NRS
11031	Ips tridens	Ips tridens		
11032	western ash bark beetle	Leperisinus californicus		
11033	Oregon ash bark beetle	Leperisinus oregonus		
11034	Orthotomicus caelatus	Orthotomicus caelatus		

CODE	Common Name	Scientific Name	Threshold	REGION
11035	cedar bark beetles	Phloeosinus spp.		
11036	western cedar bark beetle	Phloeosinus punctatus		
11037	tip beetles	Pityogenes spp.		
11038	Douglas-fir twig beetle	Pityophthorus pseudotsugae		
11039	twig beetles	Pityophthorus spp.		
11040	foureyed spruce bark beetle	Polygraphus rufipennis		
11041	fir root bark beetle	Pseudohylesinum granulatus		
11042	Pseudohylesinus dispar	Pseudohylesinus dispar		
11043	Douglas-fir pole beetle	Pseudohylesinus nebulosus		
11044	silver fir beetle	Pseudohylesinus sericeus		
11045	small European elm bark beetle	Scolytus multistriatus		
11046	spruce engraver	Scolytus piceae		
11047	hickory bark beetle	Scolytus quadrispinosus		
11048	true fir bark beetles	Scolytus spp.		
11049	Douglas-fir engraver	Scolytus unispinosus		
11050	fir engraver	Scolytus ventralis		
11051	striped ambrosia beetle	Tryachykele lineatum		
11052	Sitka spruce engraver beetle	Ips conncinnus		
11053	four-eyed bark beetle	Polygraphus spp.		
11054	hemlock beetle	Pseudohylesinus tsugae		
11055	spruce ips	Ips pilifrons		
11056	(smaller) Mexican pine beetle	Dendroctonus mexicanus		
11057	banded elm bark beetle	Scolytus schevyrewi		
11058	redbay ambrosia beetle	Xyleborus glabratus		
11059	southern cypress beetle	Phloeosinus taxodii		
11060	Mediterranean pine engraver	Orthotomicus erosus		
11800	other bark beetle (known)	other bark beetle (known)		
11900	unknown bark beetle	unknown bark beetle		
11999	western bark beetle complex	western bark beetle complex		
12000	**Defoliators**		Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	ALL
12001	casebearer			
12002	leaftier			
12003	loopers			
12004	needleminers			
12005	sawflies		Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12006	skeletonizer			
12007	larger elm leaf beetle	Monocesta coryli		
12008	spanworm			
12009	webworm			
12010	pine false webworm	Acantholyda erythrocephala		
12011	western blackheaded budworm	Acleris gloverana		
12012	eastern blackheaded budworm	Acleris variana		
12013	whitefly	Aleyrodoidae		
12014	fall cankerworm	Alsophila pometaria		
12015	alder flea beetle	Altica ambiens		
12016	mountain mahogany looper	Anacamptodes clivinaria profanata		
12017	birch leaffolder	Ancylis disigerana		
12018	oak worms	Anisota spp.		
12019	orange-striped oakworm	Anisota senatoria		
12020	western larch sawfly	Anoplonyx occidens		
12021	fruittree leafroller	Archips argyrospila		
12022	uglynest caterpillar	Archips cerasivorana		
12023	boxelder defoliator	Archips negundanus		
12024	oak leafroller	Archips semiferana		
12025	birch sawfly	Arge pectoralis		
12026	arborvitae leafminer	Argyresthia thuiella		
12027	coconut scale	Aspidiotus destructor		
12028	texas leafcutting ant	Atta texana		
12029	oak skeletonizer	Bucculatrix ainsliella	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12030	pear sawfly	Caliroa cerasi		
12031	scarlet oak sawfly	Caliroa		
12032	elm calligrapha	Calligrapha scalaris		
12033	boxelder leafroller	Caloptilia negundella		
12034	maple petiole borer	Caulocampus acericaulis		

CODE	Common Name	Scientific Name	Threshold	REGION
12035	spruce webspinning sawfly	Cephalcia fascipennis		
12036	two-year budworm	Choristoneura biennis		
12037	large aspen tortrix	Choristoneura conflictana		
12038	spruce budworm	Choristoneura fumiferana	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/ needle affected	NRS
12039	western pine budworm	Choristoneura lambertiana		
12040	western spruce budworm	Choristoneura occidentalis	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	IW; PNW
12041	jack pine budworm	Choristoneura pinus	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12042	Modoc budworm	Choristoneura retiniana		
12043	aspen leaf beetle	Chrysomela crotchi		
12044	cottonwood leaf beetle	Chrysomela scripta		
12045	leafhopper	Cicadellidae		
12046	poplar tentmaker	Clostera inclusa		
12047	larch casebearer	Coleophora laricella	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12048	birch casebearer	Coleophora serratella	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12049	lodgepole needleminer	Coleotechnites milleri		
12050	Gelechiid moths/ needleminers	Coleotechnites spp.		
12051	Black Hills pandora moth	Coloradia doris		
12052	pandora moth	Coloradia pandora		
12053	sycamore lace bug	Corythucha ciliata		
12054	lace bugs	Corythucha spp.		
12055	oak leaftier	Croesia semipurpurana		
12056	dusky birch sawfly	Croesus latitarsus		
12057	walnut caterpillar	Datana integerrima		
12058	yellownecked caterpillar	Datana ministra		
12059	walkingstick	Diapheromera femorata		
12060	spruce coneworm	Dioryctria reniculelloides		
12061	introduced pine sawfly	Diprion similis		
12062	greenstriped mapleworm	Dryocampa rubicunda		
12063	spruce needleminer (east)	Endothenia albolineana		
12064	elm spanworm	Ennomos subsignaris	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12065	maple trumpet skeletonizer	Epinotia aceriella		
12066	white fir needleminer	Epinotia meritana		
12067	linden looper	Erannis tiliaria		
12068	browntail moth	Euproctis chrysorrhoea	Any occurrence	NRS
12069	pine needleminer	Exoteleia pinifoliella		
12070	birch leafminer	Fenusa pusilla		
12071	elm leafminer	Fenusa ulmi		
12072	geometrid moth	Geometridae		
12073	leafblotch miner	Gracillariidae		
12074	spotted tussock moth	Halisidota maculata		
12075	pale tussock moth	Halysidota tessellaris		
12076	hesperiid moth	Hasora choromus		
12077	brown day moth	Hemileuca eglanterina		
12078	buck moth	Hemileuca maia		
12079	saddled prominent	Heterocampa guttivitta		
12080	variable oakleaf caterpillar	Heterocampa manteo		
12081	cherry scallop shell moth	Hydria prunivorata	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12082	fall webworm	Hyphantria cunea		
12083	hemlock looper	Lambdina fiscellaria		
12084	oak looper	Lambdina punctat		
12085	tent caterpillar moth	Lasiocampidae		
12086	satin moth	Leucoma salicis	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12087	willow leafblotch miner	Lithocolletis spp.		
12088	aspen blotchminer	Lithocolletis tremuloidiella		

CODE	Common Name	Scientific Name	Threshold	REGION
12089	gypsy moth	Lymantria dispar	Any occurrence	NRS
12090	cottonwood leafminers	Lyonetia spp.		
12091	dogwood sawfly	Macremphytus tarsatus		
12092	rose chafer	Macrodactylus subspinosus		
12093	eastern tent caterpillar	Malacosoma americanum	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	NRS
12094	western tent caterpillar	Malacosoma californicum		
12095	Pacific tent caterpillar	Malacosoma constrictum		
12096	forest tent caterpillar	Malacosoma disstria	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	NRS
12097	southwestern tent caterpillar	Malacosoma incurvum		
12098	leafcutting bees	Megachilidae		
12099	blister beetle	Meloidae		
12100	early birch leaf edgeminer	Messa nana		
12101	juniper sawfly	Monoctenus fulvus		
12102	common sawflies	Nematus spp.		
12103	balsam fir sawfly	Neodiprion abietis		
12104	lodgepole sawfly	Neodiprion burkei		
12105	blackheaded pine sawfly	Neodiprion excitans		
12106	pine infesting sawflies	Neodiprion fulviceps		
12107	redheaded pine sawfly	Neodiprion lecontei		
12109	ponderosa pine sawfly	Neodiprion mundus		
12110	white pine sawfly	Neodiprion pinetum		
12111	jack pine sawfly	Neodiprion pratti banksianae		
12112	Virginia pine sawfly	Neodiprion pratti pratti		
12113	European pine sawfly	Neodiprion sertifer		
12114	loblolly pine sawfly	Neodiprion taedae linearis		
12115	hemlock sawfly	Neodiprion tsugae		
12116	pine butterfly	Neophasia menapia		
12117	false hemlock looper	Nepytia canosaria		
12118	California tortoiseshell	Nymphalis californica		
12119	locust leafminer	Odontota dorsalis		
12120	Bruce spanworm	Operophtera bruceata		
12121	rusty tussock moth	Orgyia antiqua		
12122	whitemarked tussock moth	Orgyia leucostigma		
12123	Douglas-fir tussock moth	Orgyia pseudotsugata		
12124	western tussock moth	Orgyia vetusta		
12125	spring cankerworm	Paleacrita vernata		
12126	black citrus swallowtail butterfly	Papilio polytes		
12127	maple leafcutter	Paraclemensia acerifoliella		
12128	pine tussock moth	Parorgyia grisefacta		
12129	poinciana looper	Pericyma cruegeri		
12130	half-wing geometer	Phigalia titea		
12131	Phoberia moth	Phoberia atomaris		
12132	California oakworm	Phryganidia californica		
12133	European snout beetle	Phyllobius oblongus		
12134	citrus leafminer	Phyllocnistis citrella		
12135	aspen leafminer	Phyllocnistis populiella		
12136	yellowheaded spruce sawfly	Pikonema alaskensis	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	NRS
12137	tenlined June beetle	Polyphylla decemlineata		
12138	Japanese beetle	Popillia japonica		
12139	larch sawfly	Pristiphora erichsonii		
12140	mountain-ash sawfly	Pristiphora geniculata		
12141	elm leaf beetle	Pyrrhalta luteola		
12142	spearmarked black moth	Rheumaptera hastata		
12143	giant silkworm moth	Saturniidae		
12144	redhumped caterpillar	Schizura concinna		
12145	redbanded thrips	Selenothrips rubrocinctus		
12146	green larch looper	Semiothisa sexmaculata		
12147	maple leafroller	Sparganothis acerivorana		
12148	redhumped oakworm	Symmerista canicosta		
12149	orangehumped mapleworm	Symmerista leucitys		
12150	spruce needleminer (west)	Taniva albolineana		
12151	maple webworm	Tetralopha asperatella		
12152	pine webworm	Tetralopha robustella		
12153	introduced basswood thrips	Thrips calcaratus		

CODE	Common Name	Scientific Name	Threshold	REGION
12154	bagworm	Thyridopteryx ephemeraeformis		
12155	leafroller/seed moth	Tortricidae		
12156	willow defoliation	Tortricidae		
12157	euonymus caterpillar	Yponomeuta spp.		
12158	spruce bud moth	Zeiraphera canadensis		
12159	larch bud moth	Zeiraphera improbana		
12160	pine needle sheathminer	Zelleria haimbachi		
12161	cypress looper	Anacamptodes pergracilis		
12162	Chrysomela leaf beetle	Chrysomela spp.		
12163	pine colaspis	Colaspis pini		
12164	saddleback looper	Ectropis crepuscularia		
12165	birch leaf roller	Epinotia solandriana		
12166	New Mexico fir looper	Galenara consimilis		
12167	striped alder sawfly	Hemichroa crocea		
12168	greenstriped looper	Melanoplophia imitata		
12169	willow leaf blotchminer	Micrurapteryx salicifoliella		
12170	pine sawfly	Neodiprion autmnalis		
12171	pinon sawfly	Neodiprion edulicolus		
12172	Neodiprion gilletti	Neodiprion gilletti		
12173	Neodiprion ventralis	Neodiprion ventralis		
12174	pine looper	Phaeoura mexicanaria		
12175	Zadiprion rohweri	Zadiprion rohweri		
12176	bull pine sawfly	Zadiprion townsendi		
12177	Douglas-fir budmoth	Zeiraphera hesperiana		
12178	western oak looper	Lambdina fiscellaria somniaria		
12179	phantom hemlock looper	Nepytia phantasmaria		
12180	tent caterpillar	Malacosoma spp.		
12181	Abbot's sawfly	Neodiprion abbotii		
12182	slash pine sawfly	Neodiprion merkeli		
12183	sand pine sawfly	Neodiprion pratti		
12184	melalueca leaf weevil	Oxyops vitiosa		
12185	cypress leaf beetle	Systena marginalis		
12186	Nepytia janetae	Nepytia janetae		
12187	agromyzid fly	Agromyza viridula		
12188	elm sawfly	Cimbex americana		
12189	june beetle	Phyllophaga spp.		
12190	hickory tussock moth	Halisidota caryae		
12191	pin oak sawfly	Caliroa lineata		
12192	palmerworm	Dichomeris ligulella		
12193	pitch pine looper	Lambdina athasaria pellucidaria		
12194	red pine sawfly	Neodiprion nanulus nanulus		
12195	pine tube moth	Argyrotaenia pinatubana		
12196	baldcypress leafroller	Archips goyerana		
12197	winter moth	Operophtera brumata	Any occurrence	NRS
12198	basswood thrips	Neohydatothrips tiliae		
12199	noctuid moth	Xylomyges simplex (Walker)		
12200	pyralid moth	Palpita magniferalis	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
12201	pacific silver fir budmoth	Zeiraphera spp.		
12202	red pine needle midge	Thecodiplosis piniresinosae		
12203	western hemlock looper	Lambdina fiscellaria lugubrosa		
12204	lodgepole pine sawfly	Neodiprion nanulus contortae		
12205	silverspotted tiger moth	Lophocampa argentata		
12206	green alder sawfly	Monsoma pulveratum		
12207	conifer sawflies	conifer sawflies		
12208	ambermarked birch leafminer	Profenusa thomsoni		
12209	cycad blue butterfly	Chilades pandava		
12300	budworm	budworms	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	PNW
12800	other defloiater (known)	other defloiater (known)		
12900	unknown defoliator	unknown defoliator		

CODE	Common Name	Scientific Name	Threshold	REGION
13000	**Chewing Insects**		Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	SRS, IW
13001	grasshopper			
13002	shorthorn grasshoppers	Acrididae		
13003	black cutworm	Agrotis ipsilon		
13004	Palau coconut beetle	Brontispa palauenis		
13005	clearwinged grasshopper	Camnula pellucida		
13006	cicadas	Cicadidae		
13007	eurytomids	Eurytoma spp.		
13008	cutworms	Euxoa excellens		
13009	whitefringed beetles	Graphognathus spp.		
13010	pales weevil	Hylobius pales		
13011	vegetable weevil	Listroderes difficilis		
13012	periodical cicada	Magicicada septendecim		
13013	migratory grasshopper	Melanoplus sanguinipes		
13014	valley grasshopper	Oedaleonotus enigma		
13015	strawberry root weevil	Otiorhyhchus ovatus		
13016	black vine weevil	Otiorhynchus sulcatus		
13017	pandanus beetle	Oxycephala pandani		
13018	spaeth pandanus	Oxycephala spaethi		
13019	agamemnon butterfly	Papilio agememnon		
13020	northern pitch twig moth	Petrova albicapitana		
13021	ponderosa pine tip moth	Rhyacionia zozana		
13022	pine needle weevil	Scythropus spp.		
13023	coconut longhorned grasshopper	Segestes unicolor		
13024	clover root curculio	Sitona hispidulus		
13025	Madron thrips	Thrips madronii		
13026	ash plant bug	Tropidosteptes amoenus		
13027	shorthorned grasshopper	Valanga nigricornis		
13028	pitch-eating weevil	Pachylobius picivorus		
13029	eastern pine weevil	Pissodes nemorensis		
13030	adana tip moth	Rhyacionia adana		
13800	other chewing insect (known)	other chewing insect (known)		
13900	unknown chewing insect	unknown chewing insect		
14000	**Sucking Insects**		Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	ALL
14001	scale insects		Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
14002	western larch woolly aphid	Adelges oregonensis		
14003	balsam woolly adelgid	Adelges piceae	Any occurrence	NRS; IW; PNW
14004	hemlock woolly adelgid	Adelges tsugae	Any occurrence	NRS; IW
14005	spiraling whitefly	Aleurodicus dispersus		
14006	aphid	Aphididae		
14007	pine spittlebug	Aphrophora parallela		
14008	western pine spittlebug	Aphrophora permutata		
14009	Saratoga spittlebug	Aphrophora saratogensis		
14010	spittlebug	Cercopidae		
14011	wax scale	Ceroplastes spp.		
14012	pine needle scale	Chionaspis pinifoliae		
14014	giant conifer aphids	Cinara spp.		
14015	white pine aphid	Cinara strobi		
14016	beech scale	Cryptococcus fagisuga	Any occurrence	NRS
14017	spruce aphid	Elatobium abietinum		
14018	woolly apple aphid	Eriosoma lanigerum		
14019	striped mealybug	Ferrisia vergata		
14020	elongate hemlock scale	Fiorinia externa	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
14021	coconut red scale	Furcaspis oceanica		
14022	pine thrips	Gnophothrips spp.		
14023	leucaena psyllid	Heteropsylla cubana		
14024	honeysuckle aphids	Hyadaphis tataricae		
14025	Egyptian fluted scale	Icerya aegyptiaca		
14026	Lecanium scale	Lecanium spp.		
14027	common falsepit scale	Lecanodiaspis prosopidis		
14028	oystershell scale	Lepidosaphes ulmi		
14029	pinyon needle scale	Matsucoccus acalyptus		

CODE	Common Name	Scientific Name	Threshold	REGION
14030	ponderosa pine twig scale	Matsucoccus bisetosus		
14031	pine twig scale	Matsucoccus californicus		
14032	ponderosa pine scale	Matsucoccus degeneratus		
14033	red pine scale	Matsucoccus resinosae	Any occurrence	NRS
14034	Prescott scale	Matsucoccus vexillorum		
14035	treehoppers	Membracidae		
14036	hibiscus psyllid	Mesohomotoma hibisci		
14037	balsam twig aphid	Mindarus abietinus		
14038	hibiscus mealybug	Nipaecoccus vastator		
14039	black pineleaf scale	Nuculaspis californica		
14040	spruce spider mite	Oligonychus ununquis		
14041	twig girdler	Oncideres cingulata		
14042	woolly alder aphid	Paraprociphilus tessellatus		
14043	maple aphids	Periphyllus spp.		
14044	spruce bud scale	Physokermes piceae		
14045	red pine adelgid	Pineus borneri		
14046	pine leaf adelgid	Pineus pinifoliae		
14047	white pine adelgid	Pineus spp.		
14048	pine bark adelgid	Pineus strobi		
14049	root aphid	Prociphilus americanus		
14050	mealybug	Pseudococcidae		
14051	cottony maple scale	Pulvinaria innumerabilis		
14052	fir mealybug	Puto cupressi		
14053	Douglas-fir mealybug	Puto profusus		
14054	spruce mealybug	Puto sandini		
14055	hemispherical scale	Saissetia coffeae		
14056	woolly pine needle aphid	Schizolachnus piniradiatae		
14057	steatococcus scale	Steatococcus samaraius		
14058	pear thrips	Taeniothrips inconsequens		
14059	mulberry whitefly	Tetraleurodes mori		
14060	tuliptree scale	Toumeyella liriodendri		
14061	pine tortoise scale	Toumeyella parvicornis		
14062	citrus snow scale	Unaspis citri		
14063	birch aphid	Euceraphis betulae		
14064	Kermes scale	Allokermes spp.		
14065	Casuarina spittlebug	Clastoptera undulata		
14066	giant bark aphid	Longistigma caryae		
14067	woolly pine scale	Pseudophilippia quaintancii		
14068	european elm scale	Gossyparia spuria		
14069	elm scurfy scale	Chionaspis americana		
14070	magnolia scale	Neolecanium cornuparvum		
14071	beech blight aphid	Grylloprociphilus imbricator		
14072	beech woolly aphid	Phyllaphis fagi		
14073	Asian cycad scale	Aulacaspis yasumatsui	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	PNW
14074	European fruit lecanium scale	Parthenolecanium corni		
14075	lobate lac scale	Paratachardina lobata		
14800	other sucking insect (known)	other sucking insect (known)		
14900	unknown sucking insect	unknown sucking insect		
15000	**Boring Insects**		Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	ALL
15001	shoot borer		Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	NRS
15002	termite			
15003	ponderosa pine bark borer	Acanthocinus princeps		
15004	bronze birch borer	Agrilus anxius	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	NRS
15005	twolined chestnut borers	Agrilus bilineatus		
15006	bronze poplar borer	Agrilus liragus		
15007	carpenter bees	Apidae		
15008	flatheaded borer	Buprestidae		
15009	golden buprestid	Buprestis aurulenta		
15010	carpenter ants	Camponotus spp.		
15011	gouty pitch midge	Cecidomyia piniinopis		
15012	shootboring sawflies	Cephidae		
15013	roundheaded borer	Cerambycidae		
15014	flatheaded apple tree borer	Chrysobothris femorata		
15015	cranberry girdler	Chrysoteuchia topiaria		
15016	Columbian timber beetle	Corthylus columbianus		
15017	pitted ambrosia beetle	Corthylus punctatissimus		

CODE	Common Name	Scientific Name	Threshold	REGION
15018	carpenterworm moths	Cossidae		
15019	poplar and willow borer	Cryptorphynchus lapathi		
15020	pine reproduction weevil	Cylindrocopturus eatoni		
15021	Douglas-fir twig weevil	Cylindrocopturus furnissi		
15022	Zimmerman pine moth	Dioryctria zimmermani		
15023	oak twig borers	Elaphidionoides spp.		
15024	twig pruner	Elaphidionoides villosus		
15025	lesser cornstalk borer	Elasmopalpus lignosellus		
15026	red oak borer	Enaphalodes rufulus	Damage to ≥10% of the bole circumference	NRS
15027	ponderous borer	Ergates spiculatus		
15028	eastern pine shoot borer	Eucosma gloriola		
15029	western pine shoot borer	Eucosma sonomana		
15030	Eucosma shoot borers	Eucosma spp.		
15031	sugar maple borer	Glycobius speciosus	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	NRS
15032	Goes borers	Goes spp.		
15033	pine root collar weevil	Hylobius radicis		
15034	Warren root collar weevil	Hylobius warreni		
15035	powderpost beetle	Lyctidae		
15036	tarnished plant bug	Lygus lineolaris		
15037	bark weevils	Magdalis spp.		
15038	white pine barkminer moth	Marmara fasciella		
15039	locust borer	Megacyllene robiniae		
15040	California flathead borer	Melanophila californica		
15041	flatheaded fir borer	Melanophila drummondi		
15042	whitespotted sawyer	Monochamus scutellatus		
15043	redheaded ash borer	Neoclytus acuminutus		
15044	western ash borer	Neoclytus conjunctus		
15045	oberea shoot borers	Oberea spp.		
15046	eucalyptus longhorned borer	Phoracantha semipunctata		
15047	northern pine weevil	Pissodes approximatus		
15048	balsam bark weevil	Pissodes dubius		
15049	Monterey pine weevil	Pissodes radiatae		
15050	Engelmann spruce weevil	Pissodes strobi		
15051	lodgepole terminal weevil	Pissodes terminalis		
15052	ambrosia beetles	Platypus spp.		
15053	cottonwood borer	Plectrodera scalator		
15054	balsam shootboring sawfly	Pleroneura brunneicornis		
15055	pine gall weevil	Podapion gallicola		
15056	ash borer	Podesesia syringae fraxini		
15057	lilac borer	Podosesia syringae		
15058	carpenterworm	Prionoxystus robiniae		
15059	maple shoot borers	Proterteras spp.		
15060	western subterranean termite	Reticulitermes hesperus		
15061	coconut trunk weevil	Rhabdoscelus asperipennis		
15062	New Guinea sugarcane weevil	Rhabdoscelus obscurus		
15063	European pine shoot moth	Rhyacionia buoliana		
15064	western pine tip moth	Rhyacionia bushnelli		
15065	Nantucket pine tip moth	Rhyacionia frustrana		
15066	lodgepole pine tip moth	Rhyacionia montana		
15067	southwestern pine tip moth	Rhyacionia neomexicana		
15068	poplar borer	Saperda calcarata		
15069	roundheaded appletree borer	Saperda candida		
15070	Saperda shoot borer	Saperda spp.		
15071	clearwing moths	Sesiidae		
15072	dogwood borer	Synanthedon scitula		
15073	roundheaded fir borer	Tetropium abietis		
15074	western larch borer	Tetropium velutinum		
15075	western cedar borer	Trachykele blondeli		
15076	Douglas-fir pitch moth	Vespamima novaroensis		
15077	sequoia pitch moth	Vespamima sequoia		
15078	black twig borer	Xylosandrus compactus		
15079	Pacific dampwood termite	Zootermopsis angusticollis		
15080	subtropical pine tip moth	Rhyacionia subtropica		
15081	Asian ambrosia beetle	Xylosandrus crassiusculus		
15082	Asian longhorned beetle	Anoplophora glabripennis		
15083	cottonwood twig borer	Gypsonoma haimbachiana		
15084	southern pine sawyer	Monochamus titillator		
15085	banded ash borer	Neoclytus capraea		
15086	sitka spruce weevil	Pissodes sitchensis		
15087	emerald ash borer	Agrilus planipennis	Any occurrence	NRS

CODE	Common Name	Scientific Name	Threshold	REGION
15088	hemlock borer	Melanophila fulvoguttata	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	NRS
15089	Formosan subterranean termite	Coptotermes formosanus		
15090	sirex woodwasp	Sirex noctilio		
15091	Oregon fir sawyer	Monochamus scutellatus oregonensis		
15092	cypress weevil	Eudociminus mannerheimii		
15093	camphor shot borer	Xylosandrus mutilatus		
15094	goldenspotted oak borer	Agrilus coxalis		
15095	European oak borer	Agrilus sulcicollis		
15096	X. germanus ambrosia beetle	Xylosandrus germanus		
15097	Icosium tomentosum	Icosium tomentosum		
15800	other boring insect (known)	other boring insect (known)		
15900	unknown boring insect	unknown boring insect		
16000	**Seed/Cone/Flower/Fruit Insects**			
16001	Douglas-fir cone moth	Barbara colfaxiana		
16002	lodgepole cone beetle	Conophthorus contortae		
16003	limber pine cone beetle	Conophthorus flexilis		
16004	mountain pine cone beetle	Conophthorus monticolae		
16005	ponderosa pine cone beetle	Conophthorus ponderosae		
16006	Monterey pine cone beetle	Conophthorus radiatae		
16007	red pine cone beetle	Conophthorus resinosae		
16008	white pine cone beetle	Conopthorus coniperda		
16009	black walnut curculio	Conotrachelus retentus		
16010	Douglas-fir cone gall midge	Contarinia oregonensis		
16011	Douglas-fir cone scale midge	Contarinia washingtonensis		
16012	acorn/nut weevils	Curculio spp.		
16013	Caroline fruitfly	Dacus frauenfeldi		
16014	spruce bud midge	Dasineura swainei		
16015	fir coneworm	Dioryctria abietivorella		
16016	southern pine cone worm	Dioryctria amatella		
16017	ponderosa pine coneworm	Dioryctria auranticella		
16018	loblolly pine cone worm	Dioryctria merkeli		
16019	ponderosa twig moth	Dioryctria ponderosae		
16020	Dioryctria pseudotsugella	Dioryctria pseudotsugella		
16021	Dioryctria moths	Dioryctria spp.		
16022	lodgepole cone moth	Eucosma rescissoriana		
16023	seed chalcid	Eurytomidae		
16024	slash pine flower thrips	Gnophothrips fuscus		
16025	spruce cone maggot	Hylemya anthracina		
16026	longleaf pine seed worm or moth	Laspeyresia ingens		
16027	ponderosa pine seed moth	Laspeyresia piperana		
16028	spruce seed moth	Laspeyresia youngana		
16029	boxelder bug	Leptocoris trivittatus		
16030	leaffooted pine seed bug	Leptoglossus corculus		
16031	western conifer seed bug	Leptoglossus occidentalis		
16032	hollyhock thrips	Liothrips varicornis		
16033	Magastigmus lasiocarpae	Magastigmus lasiocarpae		
16034	spruce seed chalcid	Magastigmus piceae		
16035	ponderosa pine seed chalcid	Megastigmus albifrons		
16036	fir seed chalcid	Megastigmus pinus		
16037	Douglas-fir seed chalcid	Megastigmus spermotrophs		
16038	yellow poplar weevil	Odontopus calceatus		
16039	fruitpiercing moth	Othreis fullonia		
16040	roundheaded cone borer	Paratimia conicola		
16041	mango shoot caterpillar	Penicillaria jocosatrix		
16042	coneworm	Phycitidae		
16043	harvester ants	Pogonomyrmex spp.		
16044	citrus flower moth	Prays citri		
16045	fir cone maggot	Strobilomyia abietis		
16046	spruce cone maggot	Strobilomyia anthracina		
16047	shieldbacked pine seed bug	Tetyra bipunctata		
16048	coneworm	Hylemia spp.		
16049	prairie tent caterpillar	Malacosoma lutescens		
16050	jack pine tip beetle	Conophthorus banksianae		
16051	webbing coneworm	Dioryctria disclusa		
16052	blister coneworm	Dioryctria clarioralis		
16053	southern cone gall midge	Cecidomyia bisetosa		
16054	seed bugs	Lygaeidae spp.		

CODE	Common Name	Scientific Name	Threshold	REGION
16800	other seed/cone/flower insect (known)	other seed/cone/flower insect (known)		
16900	unknown seed/cone/ flower insects	unknown seed/cone/ flower insects		
17000	**Gallmaker Insects**			
17001	birch budgall mite	Aceria rudis		
17002	eastern spruce gall adelgid	Adelges abietis		
17003	Cooley spruce gall adelgid	Adelges cooleyi		
17004	horned oak gall	Callirhytis cornigera		
17005	oak gall wasp	Callirhytis quercuspunctata		
17006	gall midge	Cecidomyiidae		
17007	Douglas-fir needle gall midge	Contarinia pseudotsugae		
17008	gall mite	Eriophyidae		
17009	spruce gall midge	Mayetiola piceae		
17010	hackberry nipplegall maker	Pachypsylla celtidismamma		
17011	balsam gall midge	Paradiplosis tumifex	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/ needle affected	NRS
17012	hickory gall Phylloxera	Phylloxera caryaecaulis		
17013	gall aphid	Phylloxeridae		
17014	alder gall mite	Phytoptus laevis		
17015	psyllid	Psyllidae		
17016	sugarberry psyllid	Tetragonocephela flava		
17017	mountain apple psyllid	Trioza vitiensis		
17018	gouty pitch midge	Cedidomyia piniinopsis		
17019	spider mites	Oligonychus spp.		
17020	cypress gall midges	Taxodiomyia spp.		
17021	jumping oak gall wasp	Neuroterus saltatorius		
17022	erythrina gall wasp	Quadrastichus erythrinae		
17800	other gallmaking insect (known)	other gallmaking insect (known)		
17900	unknown gallmaking insect	unknown gallmaking insect		
18000	**Insect Predators**			
18001	lacewing			
18002	blackbellied clerid	Enoclerus lecontei		
18003	redbellied clerid	Enoclerus sphegeus		
18004	red wood ant	Formica rufa		
18005	western yellowjacket	Vespula pennsylvanica		
19000	**General Diseases**		Any damage to the terminal leader; damage ≥ 20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; > 20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	ALL
20000	Biotic Damage			
20001	damping off			
20002	gray mold	Botrytis cinerea		
20003	Cassytha	Cassytha filiformis		
20004	hemlock fluting			
21000	**Root/Butt Diseases**		Any occurrence	ALL
21001	Armillaria root disease	Armillaria spp.	Any occurrence	PNW; NRS
21002	yellow stringy rot	Corticium galactimum		
21003	Cylindrocladium root disease	Cylindrocladium spp.		
21004	brown crumbly rot	Fomitopsis pinicola		
21005	black root rot of pine	Fusarium oxysporum		
21006	Fusarium root rot	Fusarium spp.		
21007	white mottled rot	Ganoderma applanatum		
21008	Ganoderma rot of hardwoods	Ganoderma lucidum	Any occurrence	PNW
21009	Ganoderma rot of conifers	Ganoderma tsugae		
21010	Heterobasidion root disease	Heterobasidion annosum	Any occurrence	PNW; NRS
21011	circinatus root rot	Inonotus circinatus		
21012	tomentosus root rot/false velvet top fungus	Inonotus tomentosus		
21013	charcoal root rot	Macrophomina phaseolina		
21014	black stain root disease	Ophiostoma wageneri	Any occurrence	PNW
21015	Schweinitzii root and butt rot	Phaeolus schweinitzii	Any occurrence	PNW
21016	flame tree root disease	Phellinus noxious	Any occurrence	PNW

CODE	Common Name	Scientific Name	Threshold	REGION
21017	laminated root rot	Phellinus weirii	Any occurrence	PNW
21019	littleleaf disease/ Phytophthora root rot	Phytophthora cinnamomi		
21020	Port-Orford-Cedar root disease	Phytophthora lateralis	Any occurrence	PNW
21022	Pythium root rot	Pythium spp.		
21023	procera root disease of conifers	Verticicladiella procera		
21024	crown gall	Agrobacterium tumefaciens		
21025	borealis conk	Climacocystis borealis		
21026	yellow pitted rot	Hericium abietis		
21027	brown cubical rot	Laetiporus sulphureus	Any occurrence	PNW
21028	sudden oak death	Phytophthora ramorum	Any occurrence	PNW
21029	Rhizina root disease	Rhizina undulata		
21030	yellow root rot	Perenniporia subacida		
21031	brown top rot	Fomitopsis cajanderi		
21033	pocket dry rot	Tyromyces amarus		
21700	root or butt decay (indicators present)	root or butt decay (indicators present)		
21800	other root or butt disease (known)	other root or butt disease (known)		
21900	unknown root or butt disease	unknown root or butt disease		
22000	**Cankers**		Any occurrence	All
22005	viruses			
22006	black knot of cherry	Apiosporina morbosa	Any occurrence on the bole or on branches ≤1 foot from bole; damage to ≥50% of branches	NRS
22007	Atropellis canker	Atropellis piniphila		
22008	Siberian elm canker	Botryodiplodia hypodermia		
22009	Botryosphaeria canker	Botryosphaeria ribis		
22011	Caliciopsis canker	Caliciopsis pinea		
22012	black canker of aspen	Ceratocystis fimbriata		
22013	sycamore canker stain	Ceratocystis fimbriata f.sp. plataini		
22023	chestnut blight	Cryphonectria parasitica	Any occurrence	NRS
22025	Cryptosphaeria canker of aspen	Cryptosphaeria populina		
22026	Cytospora canker of fir	Cytospora abietis		
22029	sooty-bark canker	Encoelia pruinosa		
22030	Eutypella canker	Eutypella parasitica	Any occurrence	NRS
22032	pitch canker of pines	Fusarium subglutinans	Any occurrence	PNW
22033	Fusicoccum canker	Fusicoccum spp.		
22034	Scleroderris canker	Gremmeniella abietina		
22035	amelanchier rust	Gymnosporangium harknessianum		
22036	cedar apple rust	Gymnosporangium juniperi-virginianae		
22037	Hypoxylon canker of oak	Hypoxylon atropunctatum		
22038	Hypoxylon canker of aspen	Hypoxylon mammatum	Any occurrence	NRS
22041	European larch canker	Lachnellula willkommii		
22042	beech bark disease	Nectria coccinea	Any occurrence	NRS
22043	Nectria canker	Nectria galligena	Any occurrence	NRS
22050	Phomopsis canker	Phomopsis occulta		
22051	Phomopsis canker	Phomopsis spp.		
22052	cypress canker	Seiridium cardinale		
22053	butternut canker	Sirococcus clavigignenti-jugl.	Any occurrence	NRS
22054	maple canker	Steganosporium spp.		
22055	Thyronectria canker	Thyronectria austro-americana		
22056	citrus canker	Xanthomonas citri		
22057	Cytospora canker of aspen	Cytospora chrysosperma		
22058	Dothichiza canker	Dothichiza populae		
22060	Leucocytospora canker of spruce	Leucocytospora kunzei		
22073	hemlock canker	Xenomeris abietis		
22075	Lachnellula canker	Lachnellula flavovirens	Any occurrence	NRS
22076	strumella canker	Strumella coryneoidea	Any occurrence	NRS
22077	phomopsis blight	Phomopsis juniperovora		
22078	fusarium canker of yellow poplar	Fusarium solani		
22079	sterile conk of maple and beech	Inonotus glomeratus		
22080	canker of spruce	Aleurodiscus spp.		
22082	Discocainia canker	Discocainia treleasei		

CODE	Common Name	Scientific Name	Threshold	REGION
22083	red ring rot canker	Phellinus pini var. cancriformans		
22084	Douglas-fir cankers	Douglas-fir cankers		
22085	Scleroderris canker of western firs	Grovesiella abieticola		
22086	Thousand cankers disease	Geosmithia morbida		
22087	nonrust canker	unknown	Damage ≥20% of bole circumference (in a running 3-foot section) at point of occurrence	PNW
22099	aspen running canker	Neodothiora populina	Any occurrence	PNW-AK
22300	other canker disease (known)	other canker disease (known)		
22400	unknown canker disease	unknown canker disease		
22500	**Stem Decay**		Any visual evidence, *but do not include decay found only as a result of coring the tree.*	All
22001	heart rot		Any visual evidence	SRS
22002	stem rot			
22003	sap rot			
22004	slime flux			
22010	black rot fungus	Botryosphaeria stevensii		
22024	gray-brown sap rot	Cryptoporus volvatus		
22027	western red rot	Dichomitus squalens		
22028	Indian paint fungus	Echinodontium tinctorium	Any occurrence	PNW
22031	Fusarium cortical stem rot	Fusarium avenaceum		
22039	canker rot of oak	Inonotus hispidus		
22040	Sterile conk trunk rot of birch, chaga	Inonotus obliquus		
22044	ash heart rot	Pereniporia fraxinophila		
22047	red heart rot	Phellinus pini	Any occurrence	PNW
22048	aspen trunk rot	Phellinus tremulae		
22049	stem decay of black walnut	Phellinus weirianus		
22059	red belt fungus/brown crumbly rot	Fomitopsis pinicola		
22062	quinine fungus/brown trunk rot	Fomitopsis officinalis		
22063	brown cubical decay	Coniophora puteana		
22064	tinder fungus	Fomes fomentarius		
22065	purple conk	Hirschioporus abietinus		
22066	pinyon black stain	Leptographium wagnerii		
22067	Phellinus hartigii	Phellinus hartigii		
22068	false tinder fungus	Phellinus igniarius		
22069	robustus conk	Phellinus robustus		
22070	yellow cap fungus	Pholiota spp.		
22071	oyster mushroom	Pleurotus ostreatus		
22072	white ring rot	Poria albipellucida		
22074	cedar brown pocket rot	Poria sericeomollis		
22081	birch conk	Piptoporus betulinus		
22800	other stem decay (known)	other stem decay (known)		
22900	unknown stem decay	unknown stem decay		
23000	**Parasitic/Epiphytic Plants**		Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes or vines covering ≥ 50% of crown	ALL
23001	mistletoe	mistletoe		
23002	parasitic plants	parasitic plants		
23003	vine damage	vine damage	Vines covering ≥50% of crown	PNW; NRS
23005	white fir dwarf mistletoe	Arceuthobium abietinum f. sp. concoloris		
23006	lodgepole pine dwarf mistletoe	Arceuthobium americanum		
23007	Apache dwarf mistletoe	Arceuthobium apachecum		
23008	western dwarf mistletoe	Arceuthobium campylopodum		
23009	limber pine dwarf mistletoe	Arceuthobium cyanocarpum		
23010	pinyon dwarf mistletoe	Arceuthobium divaricatum		
23011	Douglas-fir dwarf mistletoe	Arceuthobium douglasii		
23012	Chihuahua pine dwarf mistletoe	Arceuthobium gillii		
23013	larch dwarf mistletoe	Arceuthobium laricis		
23014	western spruce dwarf mistletoe	Arceuthobium microcarpum		
23015	eastern dwarf mistletoe	Arceuthobium pusillum	Any occurrence	NRS
23016	hemlock dwarf mistletoe	Arceuthobium tsugense		
23017	southwestern dwarf mistletoe	Arceuthobium vaginatum subsp. crytopodum		
23018	dodder	Cuscuta spp.		

CODE	Common Name	Scientific Name	Threshold	REGION
23019	white fir mistletoe	Phoradendron bolleanum subsp. pauciflorum		
23020	true mistletoe (other)		True mistletoe covering ≥50% of crown	IW; PNW
23021	red fir dwarf mistletoe	Arceuthobium abietinum f. sp. magnificae		
23022	juniper true mistletoe	Phoradendron juniperum		
23023	dwarf mistletoe	Arceuthobium spp.	Hawksworth rating of ≥3	IW; PNW
23024	Weins dwarf mistletoe	Arceuthobium abietinum f. sp magnificae		
24000	**Decline Complexes/Dieback/ Wilts**		Damage ≥ 20 dieback of crown area	ALL
24001	Alaska-yellow cedar decline	Alaska-yellow cedar decline		
24002	Norfolk Island pine decline	Norfolk Island pine decline		
24003	Stillwell's syndrome	Stillwell's syndrome		
24004	ash decline/yellows	ash decline/yellows	Damage ≥ 20 dieback of crown area	NRS
24005	birch dieback	birch dieback		
24006	coconut cadang-cadang viroid	Cocadviroid coconut cadang-cadang viroid	Damage ≥ 20% dieback of crown area	PNW
24007	complex	complex		
24008	decline	decline		
24009	fall hardwood defoliator complex	fall hardwood defoliator complex		
24010	joga decline	joga decline	Damage ≥ 20% dieback of crown area	PNW
24011	larch decline	larch decline		
24012	looper abiotic complex	looper abiotic complex		
24013	maple decline	maple decline		
24014	oak decline	Hypoxylon spp.		
24015	pingelap disease	pingelap disease		
24016	sprout dieback	sprout dieback		
24017	true fir pest complex	true fir pest complex		
24018	western X disease	western X disease		
24019	pinewood nematode	Bursaphelenchus xylophilus		
24020	sapstreak disease of sugar maple	Ceratocystis coerulescens		
24021	oak wilt	Ceratocystis fagacearum	Damage ≥ 20 dieback of crown area	NRS
24022	Dutch elm disease	Ceratocystis ulmi	Damage ≥ 20 dieback of crown area	NRS
24023	bacterial wetwood	Erwinia nimipressuralis		
24024	mimosa wilt	Fusarium oxysporum f. sp. perniciosum		
24025	Verticillium wilt	Verticilium albo-atrum		
24026	bacterial leaf scorch	Xylella fastidiosa		
24027	wetwood	wetwood		
24028	hemlock decline	hemlock decline		
24029	Pacific madrone decline	Pacific madrone decline		
24030	elm phloem necrosis	Mycoplasma spp.		
24031	laurel wilt	Raffaelea spp.		
24032	sudden aspen decline	sudden aspen decline		
24800	other decline/complex/wilt (known)	other decline/complex/ wilt (known)		
24900	unknown decline/complex/ wilt	unknown decline/complex/ wilt		
25000	**Foliage diseases**		Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
25001	blight	blight		
25003	juniper blights	juniper blights		
25004	leaf spots	leaf spots		
25005	needlecast	needlecast		
25006	powdery mildew	powdery mildew		
25007	tobacco mosaic virus	tobacco mosaic virus		
25008	tobacco ringspot virus of ash	Nepovirus TRSV		
25009	true fir needlecast	true fir needlecast		
25010	sycamore anthracnose	Apiognomonia veneta		
25011	Cercospora blight of juniper	Cercospora sequoiae		
25013	large-spored spruce-laborador tea rust	Chrysomyxa ledicola		
25014	ink spot of aspen	Ciborinia whetzelii		
25015	pine needle rust	Coleosporium spp.		
25016	anthracnose on Russian olive	Colletotrichum spp.		
25017	Coronado limb rust	Cronartium arizonicum		
25018	leaf shothole	Cylindrosporium spp.		

CODE	Common Name	Scientific Name	Threshold	REGION
25019	cedar leaf blight	Didymascella thujina		
25020	dogwood anthracnose	Discula spp.		
25021	mango scab	Elsinoe magiferae		
25022	Elytroderma needle blight	Elytroderma deformans	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	PNW
25023	fire blight	Erwinia amylovora		
25024	walnut anthracnose	Gnomonia leptostyla		
25025	anthracnose	Gnomonia spp.		
25027	brown felt blight	Herpotrichia juniperi		
25028	larch needle blight	Hypodermella laricis		
25029	hardwood anthracnose	Kabatiella apocrypta		
25030	Lasiodiplodia cone damage	Lasiodiplodia spp.		
25031	spruce needle cast	Lirula macrospora		
25032	fir needle cast	Lirula spp.		
25033	white pine needle cast	Lophodermella arcuata		
25034	Lophodermella needle cast	Lophodermella spp.		
25036	Marssonina blight	Marssonina populi		
25037	Douglas-fir rust	Melampsora medusae		
25039	larch needle cast	Meria laricis		
25040	Dothistroma needle blight	Mycosphaerella pini		
25041	brown felt blight of pines	Neopeckia coulteri		
25042	snow blight	Phacidum abietis		
25043	Swiss needle cast	Phaeocryptopus gaumannii		
25044	Phoma blight	Phoma spp.		
25045	Phyllosticta leaf spot	Phyllosticta spp.		
25046	bud rot	Phytophthora palmivora		
25047	Ploioderma needle cast	Ploioderma spp.		
25048	ash rust	Puccinia sparganioides		
25049	fir and hemlock needle rusts	Pucciniastrum spp.		
25050	Rhabdocline needle cast	Rhabdocline spp.		
25051	Rhizoctonia needle blight	Rhizoctonia spp.		
25052	Rhizophaeria needle cast	Rhizophaeria spp.		
25053	Rhizopus rot	Rhizopus artocarpi		
25054	brown spot needle blight	Scirrhia acicola		
25055	Septoria leaf spot	Septoria alnifolia		
25056	Septoria leaf spot and canker	Septoria musiva		
25057	Sirococcus tip blight	Sirococcus conigenus	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	NRS
25058	Diplodia canker	Sphaeropsis sapinea		
25059	leaf blister of oak	Taphrina caerulescens		
25060	Venturia leaf blight of maple	Venturia acerina		
25061	shepherd's crook	Venturia tremulae		
25062	Dothistroma needle blight	Dothistroma septospora		
25063	yellow-cedar shoot blight	Apostrasseria spp.		
25065	spruce needle rust	Chrysomyxa weirii		
25066	cedar leaf blight	Gymnosporangium nootkatense		
25067	spruce needle cast	Lophodermium picea		
25068	hardwood leaf rusts	Melampsora spp.		
25070	hemlock needle rust	Pucciniastrum vaccinii		
25071	spruce needle cast	Rhizosphaera pini		
25072	sirococcus shoot blight	Sirococcus strobilinus	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	NRS
25073	shepherds crook	Venturia populina		
25074	Delphinella shoot blight	Delphinella abietis		
25075	tar spot	Rhytisma acerinum		
25076	birch leaf fungus	Septoria betulae		
25077	Septoria leaf spot of maple	Septoria aceris		
25800	other /shoot disease (known)	other /shoot disease (known)		
25900	unknown foliage /shoot disease	Unknown foliage /shoot disease		
26000	**Stem Rusts**		Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	ALL
26001	white pine blister rust	Cronartium ribicola	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	PNW; SRS

CODE	Common Name	Scientific Name	Threshold	REGION
26002	western gall rust	Peridermium harknessii	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	PNW
26003	stalactiform blister rust	Cronartium coleosporioides		
26004	comandra blister rust	Cronartium comandrae	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	SRS
26005	pinyon rust	Cronartium occidentale		
26006	eastern gall rust	Cronartium quercuum	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	SRS
26007	gall rust of jack pine	Cronartium quercuum f. sp. banksignae		
26008	gall rust of shortleaf pine	Cronartium quercuum f. sp. echinatae		
26009	fusiform rust	Cronartium quercuum f. sp. fusiforme	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	SRS
26010	gall rust of virginia pine	Cronartium quercuum f. sp. virginianae		
26011	Bethuli rust	Peridermium bethuli		
26012	limb rust	Peridermium filamentosum		
26013	southern cone rust	Cronartium strobilinum		
26800	other stem rust (known)	other stem rust (known)		
26900	unknown stem rust	unknown stem rust		
27000	**Broom Rusts**		≥50% of crown area affected	ALL
27001	spruce broom rust	Chrysomyxa arctostaphyli		
27002	Incense cedar broom rust	Gymnosporangium libocedri		
27003	juniper broom rust	Gymnosporangium nidus-avis		
27004	fir broom rust	Melampsorella caryophyllacearum		
27800	other broom rust (known)	other broom rust (known)		
27900	unknown broom rust	unknown broom rust		
30000	**Fire**		Damage ≥ 20% of bole circumference; >20% of stems on multi-stemmed woodland species affected ≥20% of crown affected	ALL
30001	wild fire			
30002	human caused fire			
30003	crown fire damage			
30004	ground fire damage			
41000	**Wild Animals**		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	ALL
41001	bears	Ursus spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected.	PNW

CODE	Common Name	Scientific Name	Threshold	REGION
41002	beavers	Castor canadensis	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	SRS, PNW
41003	big game	big game	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	IW, PNW
41004	mice or voles	mice or voles	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected.	PNW
41005	pocket gophers	Geomyidae spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	IW, PNW
41006	porcupines	Erethizon dorsatum	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	IW, PNW
41007	rabbits or hares	Sylvilagus spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected.	PNW
41008	sapsuckers	Sphyrapicus spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected.	IW; SRS
41009	squirrels	Sciuridae spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected.	PNW
41010	woodpeckers	Piciformes spp.		

CODE	Common Name	Scientific Name	Threshold	REGION
41011	moose	Alces alces		
41012	elk	Cervus elaphus		
41013	deer	Odocoileus spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	PNW
41014	feral pigs	Sus scrofa	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	PNW
41015	mountain beaver	Aplodontia rufa	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected.	PNW
41017	earthworms	Lumbricidae		
41800	other wild animals (known)	other wild animals (known)		
41900	unknown wild animals	unknown wild animals		
42000	**Domestic Animals**		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; > 20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
42001	cattle	Bos taurus		
42002	goats	Capra hircus		
42003	horses	Equus caballus		
42004	sheep	Ovis aries		
42800	other domestic animal (unknown)	other domestic animal (unknown)		
42900	unknown domestic animals	unknown domestic animals		
50000	**Abiotic Damage**		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; > 20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
50001	air pollutants		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; > 20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW
50002	chemical		Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	NRS

CODE	Common Name	Scientific Name	Threshold	REGION
50003	drought		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW; NRS
50004	flooding/high water		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW; NRS; SRS
50005	frost		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW
50006	hail			
50007	heat			
50008	lightning		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
50009	nutrient imbalances			
50010	radiation		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW
50011	snow/ice		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
50013	wind		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	ALL

CODE	Common Name	Scientific Name	Threshold	REGION
50014	winter injury		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW
50015	avalanche		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	IW
50016	mud-land slide			
50017	volcano			
50018	other geologic event			
50019	mechanical (non-human caused)			
50020	saltwater injury - flooding/ hurricane		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; > 20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	PNW
50800	other abiotic damage (known)	other abiotic damage (known)		
50900	unknown abiotic damage	unknown abiotic damage		
60000	**Competition**		Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC)	ALL
60001	Suppression		Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC)	IW
70000	**Human Activities**		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
70001	herbicides		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	SRS
70003	imbedded objects		Any occurrence on the bole	SRS, NRS, *PNW*
70004	improper planting technique			
70005	land clearing		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	SRS

CODE	Common Name	Scientific Name	Threshold	REGION
70006	land use conversion			
70007	logging damage		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
70008	mechanical			
70009	pesticides			
70010	roads			
70011	soil compaction			
70013	vehicle damage			
70014	road salt			
71000	Harvest		Removal of ≥10% cubic volume	ALL
71001	Woodland cutting		Removal of ≥10% cubic volume	IW
80000	Multi-Damage (Insect/Disease)			
80001	aspen defoliation (caused by 12037, 12096, 25036 and 25037)			
80002	subalpine fir mortality			
80003	five-needle pine decline			
80004	pinyon pine mortality			
85000	Invasive Plants			
90000	**Other Damages and Symptoms**		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	ALL
90001	broken top	Not recorded for multi-stemmed trees	When actual length is less than total length	IW; PNW; NRS
90002	dead top		Any occurrence	IW; PNW; NRS
90003	limby-wolf tree	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	IW
90004	forked top	Not recorded for non sawlog trees	Any occurrence	PNW
90005	forked below merch top	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	IW; PNW
90006	crook or sweep	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	IW; PNW
90007	checks, bole cracks	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	PNW
90008	foliage discoloration		Damage ≥ 20% of crown affected	IW; NRS;PNW
90010	dieback		Damage ≥ 20% of crown affected	IW, PNW, NRS
90011	open wound		Damage ≥20% of bole circumference (in a running 3-foot section) at point of occurrence	IW; PNW
90012	resinosis		Damage ≥20% of bole circumference (in a running 3-foot section) at point of origin; ≥20% of branches affected	PNW
90013	broken branches		Damage ≥20% of branches affected	PNW
99000	**UNKNOWN**		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	ALL

APPENDIX H SITE INDEX EQUATION NUMBERS

SECTION H.1 SITE INDEX EQUATION NUMBERS

California		
Equation Number	**Base Age**	**Rules**
26	100	Mixed Conifer Site = true Spcd = 202, 122, 15, 20, 117, 116, 21, 64, 81, 103, 104, 109, 124, 127, 21, 117, 120
26	100	Mixed Conifer Site = false Spcd = 201
25	50	Mixed Conifer Site = false Spcd = 211
3	50	Mixed Conifer Site = false Site Index Equation Method = Kings Spcd = 202,17
4	50	Mixed Conifer Site = false Site Index Equation Method = Primary (McCardle) TreeAge < 40 Spcd = 202, 17
5	50	Mixed Conifer Site = false Site Index Equation Method = Primary (McCardle) TreeAge ≥ 40 Spcd = 202, 17
22	50	Mixed Conifer Site = false Spcd = 20, 21
8	50	Mixed Conifer Site = false TreeAge ≤ 120 Spcd = 98, 263
9	50	Mixed Conifer Site = false TreeAge > 120 Spcd = 98, 263
17	50	Mixed Conifer Site = false TreeAge ≤ 50 Spcd = 242
18	50	Mixed Conifer Site = false TreeAge > 50 Spcd = 242
21	50	Mixed Conifer Site = false Spcd = 747, 748
20	50	Mixed Conifer Site = false Spcd ≥ 300 and ≤ 746 OR Spcd ≥ 748 and ≤ 999
14	100	Mixed Conifer Site = false Treeage ≤ 130 Spcd = 81, 103, 109, 124, 127, 120
15	100	Mixed Conifer Site = false Treeage > 130 Spcd = 81, 103, 109, 124, 127, 120
16	100	Mixed Conifer Site = false Spcd = 104

Oregon		
Equation Number	**Base Age**	**Rules**
1	50	Countycd = 29,33 Spcd = 202
2	50	Countycd = 29,33 Spcd = 15,17
6	100	Treeage ≤ 100 Countycd = east side county Spcd = 202,17,15
7	100	Treeage > 100 Countycd = east side county Spcd = 202,17,15
10	100	Treeage ≤ 100 Spcd = 21,22,11,19,264
11	100	Treeage > 100 Spcd = 21,22,11,19,264
14	100	Treeage ≤ 130 Spcd = 116, 122
15	100	Treeage > 130 Spcd = 116, 122
16	100	Spcd = 108
24	50	Spcd = 73
20	50	(Spcd ≥ 300 and ≤746) **OR** (spcd ≥ 748 and ≤ 999)
21	50	Spcd = 747
13	50	Treeage < 182 Spcd = 93
8	50	Treeage ≤ 120 Spcd = 98,263
9	50	Treeage > 120 Spcd = 98,263
17	50	Treeage ≤ 50 Spcd = 242
18	50	Treeage > 50 Spcd = 242
3	50	Countycd = west side county Spcd = 202,17 Equation Method = Kings
4	50	Treeage < 40 Countycd = west side county Spcd = 202,17 Equation Method = Primary
5	50	Treeage ≥ 40 Countycd = west side county Spcd = 202,17 Equation Method = Primary
10	100	Treeage ≤ 100 Countycd = west side county Spcd = 15
11	100	Treeage > 100 Countycd = west side county Spcd = 15
16	100	Countycd = west side county Spcd = 119

Oregon East Side Counties: 1,13,17,21,23,25,31,35,37,45,47,49,55,59,61,63,65,69

Oregon West Side Counties: 3,5,7,9,11,15,19,27,29,33,39,41,43,47,51,53,57,67,71

Washington		
Equation Number	**Base Age**	**Rules**
6	100	Treeage ≤ 100 Countycd = east side county Spcd = 202,17,15
7	100	Treeage > 100 Countycd = east side county Spcd = 202,17,15
10	100	Treeage ≤ 100 Spcd = 21,22,11,19,264
11	100	Treeage > 100 Spcd = 21,22,11,19,264
14	100	Treeage ≤ 130 Spcd = 116, 122
15	100	Treeage > 130 Spcd = 116, 122
16	100	Spcd = 108
29	50	Spcd = 73
20	50	(Spcd ≥ 300 and ≤746) **OR** (spcd ≥ 748 and ≤ 999)
21	50	Spcd = 747
13	50	Treeage < 182 Spcd = 93
8	50	Treeage ≤ 120 Spcd = 98,263
9	50	Treeage > 120 Spcd = 98,263
17	50	Treeage ≤ 50 Spcd = 242
18	50	Treeage > 50 Spcd = 242
3	50	Countycd = west side county Spcd = 202,17 Equation Method = Kings
4	50	Treeage < 40 Countycd = west side county Spcd = 202,17 Equation Method = Primary
5	50	Treeage ≥ 40 Countycd = west side county Spcd = 202,17 Equation Method = Primary
10	100	Treeage ≤ 100 Countycd = west side county Spcd = 15
11	100	Treeage > 100 Countycd = west side county Spcd = 15
16	100	Countycd = west side county Spcd = 119

Washington East Side Counties: 1,3,5,7,13,17,19,21,23,25,37,39,43,47,51,63,65,71,75,77

Washington West Side Counties: 9,11,15,27,29,31,33,35,41,45,49,53,55,57,59,61,67,69,73

APPENDIX I STOCKING TABLES

Trees are assigned stocking values in the field to assist with three measurements: 1) to determine the stocking level of a condition; 2) to assign FOREST TYPE (CORE 2.5.3)(Item 5.7.1.9) to a forested condition; and 3) to differentiate between STAND SIZE CLASS 0 (nonstocked) from other STAND SIZE CLASSes for a condition (Item 5.7.1.11). A detailed discussion of these three measurements follows the introduction.

SECTION I.1 INTRODUCTION

The tables in this appendix show the stocking values to assign to trees. Tables 5e and 5f show stocking values for trees, saplings, and seedlings when they are tallied on one acre; Table 5f is a continuation of the "5.0+ DBH of tally tree" columns of 5e.

Stocking values are assigned to the trees depending on the following three factors: 1) the size of the largest tree in the condition on the stocking subplots; 2) the species of the tree; and 3) the dbh of the tree. Each tree is assigned a stocking value based on these factors.

SECTION I.2 DETERMINING THE STOCKING LEVEL OF A CONDITION

SUBSECTION I.2.1 BACKGROUND

The Forest Inventory and Analysis definition of forest land (CONDITION CLASS STATUS = 1) was based on stocking in the Periodic and Annual inventories through 2012. Conditions with ≥10% stocking were defined as forest land. In conditions with questionable stocking, crews conducted a "stocking check" (and installed stocking subplots analogous to the Acre Method in Section 5.8) to determine if the condition was forested. Stocking values were assigned to individual trees based on the tables in this appendix, and then summed together to determine if the condition met the 10% threshold for forest land.

With the implementation of the CORE 6.0 Field Guide in field season year 2013, the definition of forest land changed to a definition based on a threshold of 10% canopy cover. The Pacific Northwest Research Station is conducting a study to determine the relationship between stocking levels and canopy cover by species and eco-region. This study will allow data users to differentiate between actual changes in forest area and changes due to the adoption of a new definition of forest land.

As part of this study, field crews will continue to initiate a stocking check (i.e., use the Acre method described in Section 5.8) on conditions where it is uncertain if ≥10% stocking is present, regardless of canopy cover. These are the same situations in which crews would have formerly done a stocking check prior to the change in the forest land definition from stocking to canopy cover. In the initial determination of stocking levels, the field crew should consider the condition over its entire area, not just the trees and seedlings that would be tallied on the subplots and microplots, especially when the plot straddles conditions.

If stocking is in question, crews MUST follow the procedures in Section 5.8 and use the AcreMethod in the field data recorder (PDR) to measure stocking and canopy cover. The acre sampling area will be used to assess stocking and canopy cover. Note that the sampled area (either the four 58.9 foot radius plots or the single 118 foot radius plot) must fall entirely in the same condition.

When assessing stocking to determine if a condition meets the former definition of forest land (≥10% stocked), include dead trees and stumps that were alive prior to recent (within approximately 30 years) disturbance.

SUBSECTION I.2.2 INSTRUCTIONS FOR USING THE STOCKING TABLES MANUALLY

The following simplified example illustrates how to use the tables manually for reference purposes.

A condition has scattered western juniper seedlings, saplings, and trees. It is unclear whether the condition is 10% stocked. The largest tree on the four quarter acre stocking plots is 22" dbh.

On the four quarter acre stocking plots (a total of one acre) the seedlings, saplings, and trees in the table that follows are tallied. Note that all the seedlings and saplings on the four quarter acre stocking plots must be counted, not just the seedlings and saplings on the four microplots. The condition is only 9.11% stocked.

Table I.1:Stocking values for the seedlings, saplings, and trees counted on the four subplots

Species	Size Class	Number Tallied on the Acre	Stocking Value for an Individual Tree (from Tables 5e and 5f)	Total Stocking Value (Number * Stocking Value)
western juniper (species 64)	seedling	75	0.011%	0.825%
western juniper (species 64)	2.0-2.9	30	0.039%	1.17%
western juniper (species 64)	7.0-8.9	12	0.16%	1.92%
western juniper (species 64)	15.0-16.9	5	0.64%	3.2%
western juniper (species 64)	19.0-20.9	2	1.00%	2%
Total	--	--	--	9.11%

SECTION I.3 USING STOCKING VALUES TO ASSIGN FOREST TYPE

FOREST TYPE is assigned to a condition based on the species with the plurality of stocking for all live trees in the condition that are not overtopped (Item 5.7.1.9). Crews are not expected to assign stocking values to individual trees measured on the subplots to assign FOREST TYPE, but the tables might be used in situations where the FOREST TYPE is not clear.

For example, a recent clear cut has an even mix of paper birch seedlings (species 375) and white spruce seedlings (species 94), and no saplings or larger trees. Paper birch seedlings have a stocking value of 0.142 and white spruce seedlings have a stocking value of .094. The FOREST TYPE is determined to be paper birch, since paper birch has a higher stocking value than white spruce. Because the two tree species are found in an equal mixture, all that matters for determining forest type is the relative difference in stocking value between the two tree species (i.e., .142 is greater than .094). Dead trees and stumps are not assigned stocking values when determining FOREST TYPE.

SECTION I.4 USING STOCKING VALUES TO DIFFERENTIATE BETWEEN STAND SIZE CLASS 0 (NONSTOCKED) AND OTHER STAND SIZE CLASSES

Forest land conditions that are less than 10 percent stocked with living trees are assigned STAND SIZE CLASS 0, nonstocked. An example of a nonstocked forest land condition would be a recent clearcut in which no trees had regenerated. The condition is forested (it had ≥10 percent canopy cover in the recent past), but is a nonstocked STAND SIZE CLASS. Conversely, if a similar recent harvest left ≥10 percent stocking, it would be STAND SIZE CLASS 1-6, depending on the size of the trees in the condition. Most often, the question is between a nonstocked STAND SIZE CLASS and STAND SIZE CLASS 1, seedling-sapling. Note that dead trees and stumps in this example count for determining stocking levels for the condition (Section 5.8), but do not count for determining STAND SIZE CLASS.

SECTION I.5 STOCKING VALUES FOR ALL TREES <7 INCHES OBSERVED ON ONE ACRE

Table 5e.

	5.0+						**4.0-4.9**					**3.0-3.9**				**2.0-2.9**			**1.0-1.9**		**Seedling**
	DBH of tally tree						**DBH of tally tree**					**DBH of tally tree**				**DBH of tally tree**			**DBH of tally tree**		
Species	5.0-6.9	4.0-4.9	3.0-3.9	2.0-2.9	1.0-1.9	Seed-ling	4.0-4.9	3.0-3.9	2.0-2.9	1.0-1.9	Seed-ling	3.0-3.9	2.0-2.9	1.0-1.9	Seed-ling	2.0-2.9	1.0-1.9	Seed-ling	1.0-1.9	Seedling	Seedling
19, 71, 93, 94	0.12	0.092	0.069	0.054	0.035	0.016	0.105	0.083	0.062	0.040	0.019	0.102	0.076	0.050	0.023	0.099	0.065	0.031	0.096	0.047	0.094
72, 73	0.10	0.075	0.057	0.044	0.028	0.013	0.086	0.068	0.050	0.033	0.015	0.083	0.062	0.041	0.019	0.081	0.053	0.025	0.079	0.038	0.076
95	0.11	0.083	0.063	0.048	0.031	0.014	0.094	0.075	0.056	0.036	0.017	0.092	0.068	0.045	0.021	0.089	0.059	0.028	0.087	0.042	0.084
130, 299	0.16	0.122	0.092	0.071	0.046	0.021	0.139	0.110	0.082	0.053	0.025	0.135	0.100	0.066	0.031	0.131	0.086	0.041	0.128	0.062	0.124
108	0.09	0.066	0.050	0.039	0.025	0.011	0.075	0.060	0.044	0.029	0.013	0.073	0.055	0.036	0.017	0.071	0.047	0.022	0.069	0.034	0.067
103, 104, 119	0.07	0.055	0.042	0.032	0.021	0.009	0.063	0.050	0.037	0.024	0.011	0.062	0.046	0.030	0.014	0.060	0.039	0.019	0.058	0.028	0.056
53, 54, 55, 62, 64, 65, 66, 101, 102, 106, 109, 113, 116, 117, 120, 122, 124, 127, 133, 137, 138, 139, 321, 475, 756, 757, 758, 811	0.09	0.067	0.051	0.039	0.025	0.011	0.077	0.061	0.045	0.029	0.014	0.074	0.055	0.036	0.017	0.072	0.048	0.023	0.070	0.034	0.068
15, 201, 202, 511	0.12	0.090	0.068	0.053	0.034	0.015	0.103	0.082	0.061	0.040	0.018	0.100	0.075	0.049	0.023	0.098	0.064	0.031	0.095	0.046	0.092
11, 14, 17, 20, 21, 22, 41, 42, 81, 92, 98, 231, 242, 251, 263, 264	0.09	0.063	0.048	0.037	0.024	0.011	0.072	0.057	0.043	0.028	0.013	0.070	0.052	0.034	0.016	0.068	0.045	0.022	0.067	0.032	0.065
211, 212	0.07	0.050	0.038	0.029	0.019	0.009	0.057	0.046	0.034	0.022	0.010	0.056	0.042	0.027	0.013	0.054	0.036	0.017	0.053	0.026	0.051
312, 341, 421, 424, 631, 763, 768, 821, 997, 999	0.17	0.128	0.097	0.075	0.048	0.022	0.146	0.116	0.086	0.056	0.026	0.142	0.105	0.069	0.033	0.138	0.091	0.043	0.134	0.065	0.130
351, 352, 492	0.21	0.156	0.118	0.091	0.059	0.026	0.178	0.141	0.105	0.068	0.032	0.173	0.128	0.084	0.040	0.168	0.111	0.053	0.163	0.079	0.159
333	0.19	0.145	0.110	0.085	0.055	0.025	0.165	0.131	0.097	0.063	0.030	0.161	0.120	0.078	0.037	0.156	0.103	0.049	0.152	0.074	0.148
375	0.19	0.140	0.106	0.082	0.053	0.024	0.160	0.127	0.094	0.061	0.028	0.155	0.115	0.076	0.036	0.151	0.099	0.047	0.147	0.071	0.142
361, 431, 661, 801, 805, 807, 815, 818, 839, 981	0.21	0.155	0.117	0.090	0.058	0.026	0.176	0.140	0.104	0.068	0.032	0.172	0.128	0.084	0.039	0.167	0.110	0.053	0.162	0.079	0.158
603, 604	0.23	0.169	0.128	0.099	0.064	0.029	0.193	0.153	0.114	0.074	0.034	0.188	0.140	0.091	0.043	0.183	0.120	0.057	0.178	0.086	0.172
741, 746	0.20	0.146	0.110	0.085	0.055	0.025	0.166	0.132	0.098	0.064	0.030	0.162	0.120	0.079	0.037	0.157	0.103	0.049	0.153	0.074	0.148
540, 542	0.17	0.124	0.094	0.072	0.047	0.021	0.141	0.112	0.083	0.054	0.025	0.138	0.102	0.067	0.032	0.134	0.088	0.042	0.130	0.063	0.126
313, 345, 463, 730, 747, 748	0.19	0.143	0.109	0.084	0.054	0.024	0.164	0.130	0.097	0.063	0.029	0.159	0.118	0.078	0.037	0.155	0.102	0.049	0.151	0.073	0.146

SECTION I.6 STOCKING VALUES FOR ALL TREES 5.0 INCHES AND GREATER OBSERVED ON ONE ACRE

Table 5f.

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
19, 71, 93, 94	0.12	0.19	0.26	0.34	0.43	0.53	0.63	0.73	0.84	0.96	1.08	1.20	1.33
72, 73	0.10	0.17	0.24	0.33	0.44	0.55	0.67	0.81	0.95	1.11	1.27	1.45	1.63
95	0.11	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.48	0.52	0.56	0.60
130, 299	0.16	0.26	0.37	0.49	0.63	0.78	0.94	1.11	1.29	1.48	1.68	1.89	2.11
108	0.09	0.14	0.21	0.29	0.37	0.47	0.57	0.69	0.81	0.94	1.07	1.22	1.37
103, 104, 119	0.07	0.12	0.18	0.25	0.32	0.41	0.50	0.60	0.70	0.82	0.94	1.07	1.20
53, 54, 55, 62, 64, 65, 66, 101, 102, 106, 109, 113, 116, 117, 120, 122, 124, 127, 133, 137, 138, 139, 321, 475, 756, 757, 758, 811	0.09	0.16	0.25	0.36	0.49	0.64	0.81	1.00	1.21	1.44	1.69	1.96	2.25
15, 201, 202, 511	0.12	0.19	0.27	0.35	0.45	0.55	0.66	0.78	0.90	1.03	1.16	1.30	1.45
11, 14, 17, 20, 21, 22, 41, 42, 81, 92, 98, 231, 242, 251, 263, 264	0.09	0.14	0.20	0.27	0.35	0.44	0.53	0.64	0.75	0.86	0.98	1.11	1.25
211, 212	0.07	0.11	0.16	0.22	0.28	0.35	0.43	0.51	0.60	0.69	0.79	0.90	1.01
312, 341, 421, 631, 768, 821, 997, 999	0.17	0.27	0.37	0.49	0.63	0.77	0.92	1.08	1.25	1.43	1.62	1.81	2.01
351, 352, 492	0.21	0.31	0.43	0.56	0.69	0.83	0.98	1.14	1.31	1.48	1.65	1.83	2.02
333	0.19	0.33	0.50	0.71	0.94	1.21	1.50	1.83	2.18	2.56	2.97	3.41	3.88
375	0.19	0.32	0.49	0.70	0.93	1.20	1.50	1.83	2.19	2.58	3.00	3.45	3.93
361, 431, 661, 801, 805, 807, 815, 818, 839, 981	0.21	0.33	0.48	0.64	0.83	1.03	1.24	1.48	1.73	1.99	2.27	2.56	2.86
603, 604	0.23	0.35	0.49	0.64	0.81	0.99	1.18	1.38	1.60	1.82	2.05	2.29	2.54
741, 746	0.20	0.30	0.41	0.54	0.67	0.82	0.97	1.13	1.30	1.48	1.66	1.85	2.05
540, 542	0.17	0.23	0.30	0.36	0.43	0.50	0.58	0.65	0.72	0.80	0.87	0.95	1.03
313, 345, 463, 730, 747, 748	0.19	0.33	0.50	0.70	0.93	1.19	1.49	1.81	2.16	2.54	2.95	3.38	3.85

APPENDIX J SUDDEN OAK DEATH SYNDROME ASSESSMENT

SECTION J.1 SUDDEN OAK DEATH SYNDROME ASSESSMENT

Evidence of infection by Phytophthora ramorum, the pathogen responsible for sudden oak death, can be observed in two forms: leaf spots and oozing cankers. Leaf spots may be observed on several known hosts: bay laurel (Umbellaria californica), rhododendron (Rhododendron spp.), toyon (Heteromeles arbutioflia), big leaf maple (Acer macrophyllum), and Buckeye (Aesculus californica). Bleeding cankers may be observed on the boles of coast live oak (Quercus agrifolia), California Black Oak (Quercus kellogii), and tanoak (Lithocarpus densiflorus).

If either type of symptom (spots or cankers) is observed, crews should seek to find bay laurel leaves exhibiting leaf spots, as these are the most likely to supply material capable of generating positive lab conformation on the presence of Phytophthora ramorum. The second best candidate species for confirming symptoms is tanoak. Only if spotted bay laurel leaves or tanoak leaves exhibiting browning of the petiole cannot be found, expand the search to include spotted leaves from other species listed above. If such leaves are found, collect a total of 30, spot-exhibiting leaves. If more than one host species is required in order to obtain 30 leaves, it is acceptable to mix leaves, but bay laurel is the preferred host for isolation, so if it is present, get as many of the 30 leaves as possible from that host species. If more than one bay tree is present with symptoms, collect samples from each bay tree with leaf spots. Clip the twigs with the spot exhibiting leaves attached and send the entire branch tip since this keeps specimens fresher longer.

It is possible to collect an "on plot" and an "off plot" sample for the same plot (they would be sent in with a different PDR collection form bearing a different PDR collection sticker number).

Leaves should be double bagged and labeled with the following location information: the county, the date of collection, a matching PDR number sticker, and crew leader name. A clean dry paper towel should be inserted in the bag with the leaves to absorb excess moisture. The crew will mail the sample to the Rizzo Lab at University of California (address below) along with the original PDR form (minus the plot number). The crew will write the plot number on to a copy of that original PDR form, scan this copy and send (email/ mail) to the California Coordinator. The PDR form copy should be mailed to the California Coordinator at this time; do not wait until the end of the field season! The plant material (Leaves-Twigs) should be kept cool and mailed within 2 days after collection.

Any time that a sample is collected for lab analysis, refer to instructions in Subsection 4.3.6, Sudden Oak Death Sample Collection for recording in MIDAS.

A Pest Detection Report (PDR) form should be filled out as follows. [The plot number should NOT be recorded on the original form sent to the Rizzo Lab, but SHOULD be recorded on the second copy (sent to CA Coordinator):

STATE OF CALIFORNIA
DEPARTMENT OF FOOD AND AGRICULTURE
PLANT HEALTH AND
PEST PREVENTION SERVICES

PEST AND DAMAGE RECORD

65-020 (11/2002)

PDR NUMBER Attach STICKER Here

Date collected XX XX XX

Time

Lab ☐ ENTO ☐ PLANT PATH ☐ NEMA ☐ SEED ☐ BOTANY ☐ VERT

NOR Number:

Number of samples:

Location: Activity / Situation / Section / Township N S / Range E W / Base and meridian H M S

Owner/receiver

Name: "Private" or "Public"

Address/physical description

City | State | Zip code

County

Phone | Fax | Latitude

E-mail | Longitude

Cross street

Quarantine destination: "Davis"

Collector: "PNW FIA"

Affiliation: F ☐ S ☐ C ☐ E ☐ U ☐ O ☐ Describe other

Quarantine shipper/broker

Name

Address

City | Zip code

State/Country

Phone | Fax | Latitude

E-mail | Longitude

Quarantine origin (where host grown)

City | County: **County Name** | State/Country | Zip code

Shipment size (include units) | Program

Carrier (ground/air/maritime)

Business name | Flight number

License plate | License state | Tail/ship number

Submitter remarks

"Check for P. ramorum"

Suspect:

Send report to "Michelle Gerdes (503)808-2191
PNW Research Station, 620 SW Main St. Ste 502
Portland, OR 97205 michelle.a.gerdes@usda.gov"

General or Plant Pathology

Number of ☐ plants ☐ acres involved:

☐ Number ☐ Percent of plants affected:

Plant distribution: ☐ Limited ☐ Scattered ☐ Widespread ☐ Eradicated

Plant parts affected

☐ Bark ☐ Bulbs or corms ☐ Leaves, upper surface
☐ Blossoms ☐ Fruit or nuts ☐ Petiole ☐ Stem
☐ Branches, large ☐ Growing tips ☐ Rootlets ☐ Trunk
☐ Branches, terminal ☐ Large roots ☐ Seeds ☐ Tubers
☐ Buds ☐ Leaves, lower surface

Plant symptoms ☐ Limited ☐ General

☐ Canker ☐ Gumming ☐ Malformation ☐ Slow decline
☐ Die back ☐ Internal discoloration ☐ Marginal burn ☐ Stunting
☐ Fruit rot ☐ Leaf fall ☐ Root rot ☐ Sudden collapse
☐ Fruit spot ☐ Leaf mottling ☐ Rough bark ☐ Wilting
☐ Galls ☐ Leaf spot ☐ Shot hole ☐ Yellowing

Weed or Vertebrate

Acreage: Net Gross

Entomology

Trap number | Grid number | Last service date | Latitude

Trap type | Trap density per | Longitude

Total pest count or number per (sweep, leaf, acre, trap, root, stem, etc) | Survey method

Count: per

Conditions ☐ Dead ☐ Alive ☐ Unknown

Stages ☐ Egg ☐ Larva ☐ Nymph ☐ Pupa ☐ Adult

Sample

Lot number | Nema type (raw, vial, slide):

Host/crop name

Common name | Type (plants, fruit, seeds): "Leaves" or "Twigs"

Scientific name: **Species of Sample** | Quantity: **# collected** | Units

Container size: | Container units:

Nema field block: commercial foundation increase

PDR NUMBER

Determination | Rating

DO NOT write anything here on the original for that is sent to Rizzo Lab along with the plant sample(s).

On the scanned/copied form (to be emailed/mailed to the CA Coordinator) write the five-digit Plot Number here.

Determined by: | Date:

- **PDR Number:** Attach a "PDR number sticker" to the form here (there will be four stickers in a row with the same unique number on your PDR SOD sticker sheet) Attach the second matching "PDR number sticker" onto the sample container (plastic bag with leaf samples). The third "PDR number sticker" can be attached to the scanned/copied form to be sent to Michelle Gerdes. The fourth "PDR number sticker" is for another sample bag or backup in case of damage to one of the first three stickers. DO NOT MIX unique "PDR number stickers" within a single reported sample/form/copy (all three should have the same number attached or recorded).

  This six digit number will also be entered into the data recorder when prompted (Plot Level Data Screen>SOD = Y, PNWRS>SODPlot>SODPDRNbr)

- **Date:** List the date the sample was taken.
- **Owner:** Only identify if the owner is "Public" or "Private". It is a violation of the NDA to write a landowner's name on this form. Do not fill out Address or City information. Do not include Township Range and Section.
- **Collector:** Write "PNW FIA" on this line (Unless it is already entered)
- **Quarantine Destination:** Write "Davis" in this box (Unless it is already entered)
- **Quarantine Origin:** List the county in which the sample was obtained.
- **Remarks:** Write "Check for P. ramorum" (Unless it is already entered)
- **Host/ Crop Name - Scientific Name/-Type:** Write the species of the sample that is being sent to Rizzo. Type should be Leaves/Twigs
- **Determination:** Do not write anything on the original form being sent along with the sample. With the copied/scanned form (to be sent to Michelle Gerdes) write the five digit Plot Number here.
- **Send Report To:** Fill out this line with Michelle Gerdes, PNW Research Station, Portland Forestry Sciences Lab*.
- Send the original copy of the completed form along with the sample (both with matching "PDR number sticker" attached) to - **Attn: SOD Diagnostics Rizzo Lab, Dept. of Plant Pathology University of California, One Shields Ave, Davis, CA 95616.**
- Scan the original form and email to - Michelle Gerdes at michelle.a.gerdes@usda.gov. If you don't have access to a scanner, make a duplicate of the original (include plot number on this duplicate) and physically mail this copy to: Michelle Gerdes at the **Pacific Northwest Research Station, Portland Forestry Sciences Lab, 1220 SW 3rd Avenue, Suite 1410, Portland, OR 97204**

Note: It is imperative that field gear and boots be disinfected using bleach, Lysol, or 70+% alcohol after working in confirmed or suspected SOD areas. The underside of vehicles must be washed daily if off pavement travel has occurred in SOD areas and before leaving any county where SOD is known to occur (Humboldt, Mendocino, Lake, Napa, Sonoma, Solano, Marin, San Francisco, Contra Costa, Alameda, San Mateo, Santa Clara, Santa Cruz and Monterey counties).

APPENDIX K DOUGLAS-FIR TREE CORE SPECIAL STUDY

SECTION K.1 DOUGLAS-FIR TREE CORE SPECIAL STUDY

The following protocol supports a pilot project investigating historical climate patterns from Douglas-fir tree ring data.

There are two primary goals for use of the resulting data: 1) to produce a plot-linked database of radial growth that could be used for growth model development, model validation, and other biometric analyses, and 2) to develop a gridded dendroecological database that could be used to analyze regional patterns of climate, disturbance, and other ecosystem-scale processes.

Analysts will provide feedback concerning the quality of the cores, but there is no formal QA scoring for this special study.

An increment borer, paper straws and a fine tipped permanent marker are required field equipment for this study. A PVC tube or similar should be carried to ensure the tree cores can remain intact while being transported safely from the field to office.

SECTION K.2 TREE CORE SAMPLE COLLECTION

Select crews in areas likely to regularly encounter large Douglas-fir trees will be asked to participate in this pilot protocol. Ensure specimen collection is not prohibited before removing material from the site.

SUBSECTION K.2.1 TREE SELECTION

Collect a tree core from one or more dominant, co-dominant, or open grown live Douglas-fir tally tree greater than 5" diameter. Collect this core from the largest tree(s) meeting this criteria as able; safety and efficient use of time are higher priorities than sampling the largest tree.

If during the course of normal plot operations you core a tree for age and growth estimates, it is ok to also collect that core for this special study.

Do not use cores collected from site-tree-only or witness-only trees. Tree cores for this study MUST be a tally tree (our way to link the tree ring data to other tree variables).

When collected:	When STATE = 06, 16, 32, 41 or 53 Duty Station = Bend, Chico, CleElum, Eugene, Grants Pass, Klamath Falls, La Grande, Mt Shasta, Nevada City, Okanogan, Olympia, Portland, Redding, Sedro-Woolley CREW TYPE = 1 PLOT STATUS = 1 Tree SPECIES code = 202 DIAMETER AT BREAT HEIGHT ≥ 5.0 inches CROWN CLASS = 1, 2 or 3

SUBSECTION K.2.2 CORE COLLECTION

Step 1. Remove one increment core from the tally tree following standard protocol (Item 8.7.1.1 (A) in field manual).

Step 2. Bore into the tree as far as possible aiming for the center, but do not core again if you miss pith or increment borer is too short or you encounter rot. Keep cores even if they are partial, damaged, or have writing on them (ex. growth increments) - they can still be used for this project.

Step 3. Immediately transfer core into paper straws. Tip to help avoid losing bark and outer rings or pieces of broken cores: as you pull extraction spoon out of borer shaft, simultaneously slide the core into the straw.

Step 4. Fold over ends of straw to close. Be careful not to bend the straw.

Step 5. Label straw (using a fine-tipped permanent marker) with: State # (Item 4.2.1.1), Plot # (Item 4.2.1.3), Tree Tag # (Item 8.5.1.3), and tree DBH (Item 8.6.4.2). **The sample cannot be used if label information is missing or illegible.**

Step 6. Transport straw out of plot in PVC tube or any other secure method.

SECTION K.3 TREE CORE STRAW STORAGE AND SHIPPING

SUBSECTION K.3.1 CORE STORAGE

Storage of cores requires only that they are safe from being broken, lost, or developing mold/mildew. Keep in open/uncapped cardboard tube or anywhere in the open air with shelter from moisture. Do not store cores in the PVC tube that will be going back out in the field because of risk of loss or damage - keep them in truck, hotel room, at home.

SUBSECTION K.3.2 CORE SHIPPING

Ship cores to the Portland Forestry Sciences Lab. ATTN: Jane Terzibashian as able (recommended at least every three weeks for QA purposes). Loosely bind cores together with a rubber band to reduce potential for damage during shipping.

Jane Terzibashian

Portland Forestry Sciences Lab

1220 SW 3rd Avenue, Suite 1410

Portland, OR 97204

Use poster tubes or boxes, not envelopes for shipping.

Contact Jane Terzibashian, jane.terzibashian@usda.gov for detailed instructions regarding what job code to use for the shipment. Contact Janelle Cossey janelle.cossey@usda.gov to source additional paper straws, reminder stickers or shipping tubes.

APPENDIX L HISTORICAL INVENTORY INFORMATION

SECTION L.1 THE INVENTORY OF CALIFORNIA

SUBSECTION L.1.1 CALIFORNIA INVENTORY BACKGROUND

In California, PNW-FIA collects data on all lands, across all ownerships, including national forests and reserved areas such as state and national parks. The state has been divided into six inventory units: North Coast, North Interior, Sacramento, Central Coast, San Joaquin, and Southern. The annual inventory of California represents the fourth measurement of plots established by PNW Research Station. California plots were previously measured in 1965-1972, Occasion 1; 1981-1984, Occasion 2; and in 1991-1994, Occasion 3.

At Occasion 1, plots were selected from a 0.85 mile primary sample grid using stratified random sampling. This method utilized several different scale photos and selected plots outside of national forest lands and all reserved (municipal, state, and national parks) lands. The actual plot was of a 10-point configuration that did not utilize mapping to show different condition classes. Only timberland plots were established and measured on the ground outside of all reserved land areas.

At Occasion 2, a more standardized 3.4 mile base grid was used in plot selection, with woodland plots only being established using a 6.8 mile grid resulting in every 4th woodland plot being measured. At this time, some plots from the Soil Conservation Service (currently the National Resource Conservation Service, NRCS) were incorporated in to the selection process thus augmenting the selection process. The plot design varied between a 5-point design for new installed plots to a 3-point design for remeasured plots from Occasion 1.

At Occasion 3, further refinement of the plots selection process continued. The field plot grid was spaced again at 3.4 mile intervals, but little augmentation was applied in selecting plots off grid as in Occasion 2. Limited juniper plots were sampled, and the oak woodland plots were again established but only every second plot using the 3.4 grid was measured (this is called the 11k grid as seen on Occasion 3 plot cards). Although the field grid used at this occasion was established in 1981, about half of the plots are at locations established before 1981 inherited from previous occasions detailed above.

SUBSECTION L.1.2 CALIFORNIA INVENTORY DATES

Occasion 1: 1965-1972

Occasion 2: 1981-1984

Occasion 3: 1991-1994

SUBSECTION L.1.3 CALIFORNIA INVENTORY DESIGN

The California Annual Inventory design is based on a double sample for stratification as described by Cochran (1977, p. 327-335), but differing from Cochran's description in that both primary and second phases are permanent, systematic grids of photo and field plots, therefore not strictly allocated proportionally by stratum. The primary plots (Phase 1) are on a 0.85 mile (1.37 kilometer) photo interpretation (PI) grid that was established on base maps and transferred to aerial photos used in the periodic surveys of occasions 1, 2, and 3. This Phase 1 grid is further sub-sampled by a secondary field grid (Phase 2) in which the plots are laid out with 1 field plot per 6,000 acres. This provides an average of one Phase 2 or FIA field grid location for every 13 Phase 1 photo plots. The Phase 1--the photo grid--is used to stratify inventoried area by land class and degree of urbanization, and where forest land is stratified by forest condition. The stratification reduces overall variance, resulting in more precise estimates of forest area and volume statistics. Data collected on the Phase 2 field plots are used to adjust area estimates developed from classification of the Phase 1 grid and to obtain comprehensive information about forest conditions that is of known precision (MQO's and tolerances for every variable that has data collected). During the periodic survey, large areas of continuous nonforest lands were not sampled with field plots. Areas such as extensive agricultural lands, urban areas, hard chaparral, and desert were not sampled due to the vastness of these areas, and also the fact that change in these areas happened over such a long time that the current sampling methods were ill suited in these areas. It was also not a goal to track resource data in nonforested areas, since the surveys were geared toward forested resources only.

SUBSECTION L.1.4 OCCASION 3 PLOT LAYOUT IN CALIFORNIA

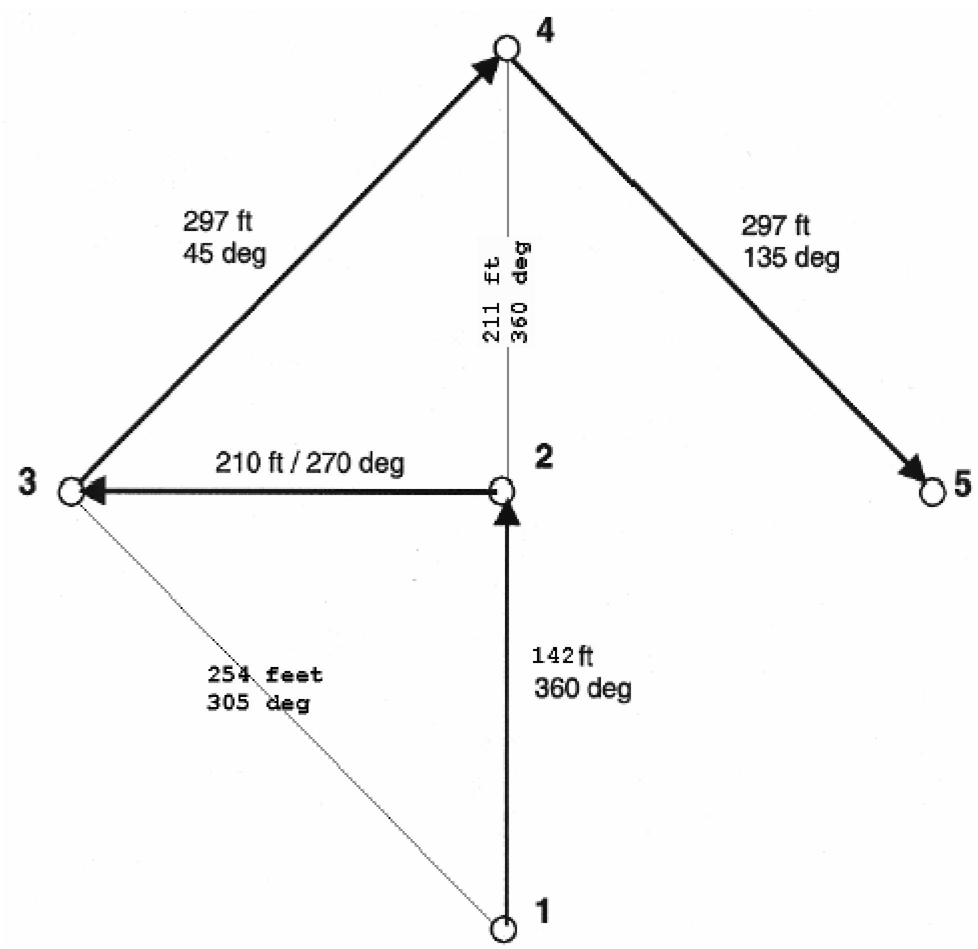


Figure L.1: Occasion 3 plot layout in California

SECTION L.2 THE INVENTORY OF OREGON AND WASHINGTON

SUBSECTION L.2.1 OREGON AND WASHINGTON INVENTORY BACKGROUND

In the late 1950s, PNW-FIA generated a grid of field locations across all lands in Washington and Oregon. This was done on USGS maps or other available map coverage. To generate the grid on these maps, a point was selected randomly, and from this point grid lines were mapped out on cardinal directions every 3.4 miles. The intersections of these east-west and north-south lines on the maps became the basis for locating field plots on the ground in all PNW-FIA inventories since the late 1950s. In some cases, the grid was drawn county by county, and errors caused gaps or concentrations in the grid where the lines did not match up along county boundaries.

SUBSECTION L.2.2 OREGON/ WASHINGTON INVENTORY DESIGN

The Oregon and Washington annual inventory design is based on a double sample for stratification as described by Cochran (1977, p. 327-335), but differing from Cochran's description in that both primary and second phases are permanent, systematic grids of photo and field plots and therefore, not strictly allocated proportionally by stratum. The primary plots are on a 0.85 mile (1.37 kilometer) grid that was established on base maps and transferred to aerial photos. The primary grid is subsampled by the secondary field grid. The field plot grid is laid out with 1 field plot per 6,000 acres, providing an average of one secondary field grid location for every 13 primary photo plots. The primary phase--the photo grid--is used to stratify inventoried area by land class and degree of urbanization, and, where forest land, by forest condition. The stratification reduces overall variance, resulting in more precise estimates of forest area and volume statistics. Data collected on the field plots are used to adjust area estimates developed from classification of the primary grid and to obtain comprehensive information about forest conditions that is of known precision.

SUBSECTION L.2.3 OREGON

Occasion 1

All Oregon counties were assigned to one of five administrative units, the Southwest unit, West-Central, Northwest, Central, or the Blue Mountain unit. Plots were established in 1961-1962 (Southwest, West-Central, and Northwest), 1964 (Central) and 1969 (Blue Mountains) using a 10-subplot, 1-acre plot. The counties and their units are listed in Appendix B (Reference Information).

Occasion 2

At Occasion 2 the 1-acre, 10-subplot plots were remeasured in Douglas County in 1973, the Southwest unit in 1974, the West-Central in 1975, and the Northwest in 1976. In 1977 a new 5-subplot, 10-acre plot was established in the Central unit, and 3 of the 10 original subplots were remeasured. The Blue Mountain unit was measured in 1977 with a “walk-through” inventory that classified trees as living, mortality or cut, and which updated the seedling, sapling and tree tally.

Occasion 3

In 1984-1986 the new 5-subplot, 10-acre plot design was established in western Oregon, and 3 of the previous 10 subplots were remeasured. About 99 hardwood plot areas were projected at this time with models in western Oregon. In Central Oregon 1/6 of the 5-subplot, 7.5-acre plots were remeasured in 1986. In 1987 the remaining 5/6 of these plots were surveyed with the “walkthrough” method described above. Also in 1987, the 5-subplot, 7.5-acre plot design was established in the Blue Mountains, while 3 of the previous 10 subplots were remeasured. In eastern Oregon at this time, about 57 5-subplot, 10-acre juniper plots were established for the Oregon juniper inventory.

Occasion 4

At Occasion 4 the 5-subplot, 7.5-acre plot design was used for remeasurement and new data in western Oregon in 1995-1997, and for eastern Oregon timberland plots in 1998 and 1999. In 1999 approximately 600 juniper plots were established in eastern Oregon using the 4-subplot, 24.0 foot fixed-radius plot design.

SUBSECTION L.2.4 WASHINGTON

All Occasions

See Subsection L.2.5, Oregon and Washington Previous Plot Layouts.

SUBSECTION L.2.5 OREGON AND WASHINGTON PREVIOUS PLOT LAYOUTS

Usually, the 5-subplot plots installed at occasions 2 and 3 were laid out in the standard pattern diagrammed in Figure L.2: Previous plot layouts in Oregon and Washington. However, subplots were installed at positions off of the standard pattern in order to keep all five subplots entirely within the same forest land class and stand condition (broad forest type and stand size); i.e., subplots were never split between forest and nonforest land or between different stand condition classes.

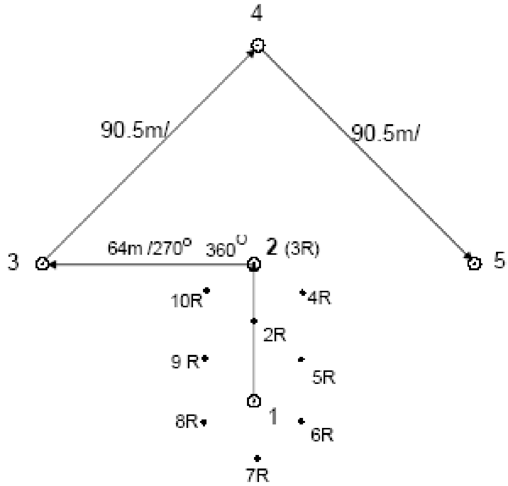
The location of subplots that were not on the standard pattern was determined one of two ways:

1. A substitute subplot location (a "substituted subplot") was adopted if the center of the standard subplot location was in different forest land class or forest condition than was present at the field grid location.
2. If the subplot center was in the same forest land class and forest condition class as the field grid location, but was within 58.9 feet of a different land class or forest condition class, the standard subplot center was moved (a "moved subplot") until 58.9 feet inside the same forest land class and forest condition present at the field grid location.

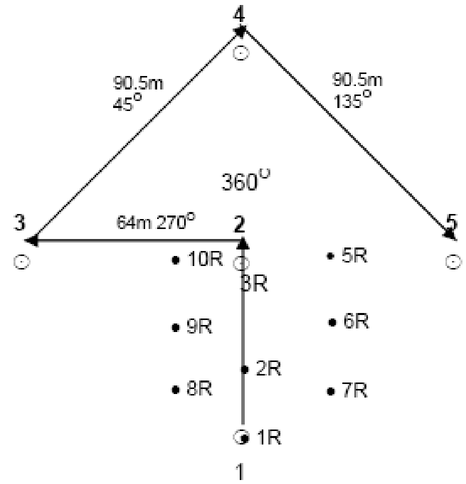
At Occasion 3, a single fixed-radius plot (16.95, or 17.0 meter radius) for sampling the vegetation profile was installed at field grid locations that fell in forest land classified as other forest-rocky, chaparral, or unsuitable site (GLCs 41, 45, 46) or were at locations that ordinarily required a 5-subplot plot but were too hazardous (cliffs etc.) to allow its installation.

At Occasion 4, the 5-subplot plot installed on all western Oregon and all eastern Oregon timberland locations is diagramed in Figure L.2: Previous plot layouts in Oregon and Washington. All subplots are laid out in their standard location across condition classes to collect data about the current status of forest resources.

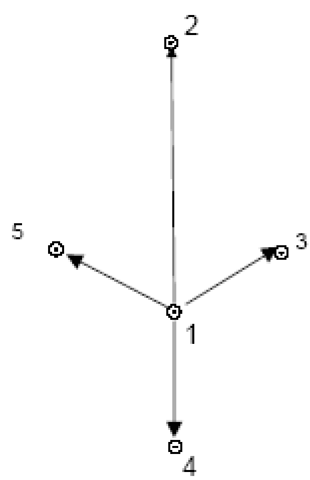
The 1999 eastern Oregon juniper inventory used the same plot layout as the annual inventory.



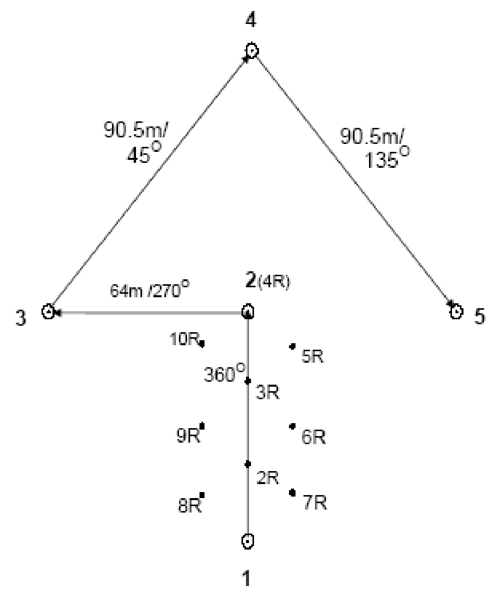
Blue Mountain Unit Oc3
Oc4 (no R-points included)
Puget Unit, Oc1
Olympic Unit, Oc1
Point 1 to 2 = 42.6m (140')



Western OR, Oc3
Oc4 (no R-points included)
Southwestern WA Unit, Oc2 & Oc3
Point 1 to 2 = 55m (180')



Eastern WA unit Oc2, Oc3 & Oc4



Central OR; Oc2, Oc3 & Oc4 (no R-points included)
Oc 4 (no R-points included)
Point 1 to 2 = 64m (210')

Figure L.2: Previous plot layouts in Oregon and Washington

SECTION L.3 PNW TREE HISTORY CODES AND DEFINITIONS FROM PERIODIC INVENTORIES

“Cond Class”, codes 1-5, indicates the condition class that the tree is located in. The second digit indicates the tree history (TH) needed for all trees.

Cond Class	TH	Tree History	Description
1-5	0	No tally	Enter a line with TH 0 for subplots that do not have any live tally trees (TH 1,2,4,6). Enter a line for nonforest subplots and GLC 44 subplots, which are not on the 11K grid.
1	1	Remeasured	Tree tallied live at OCC2 and still live at OCC3.
1	2	Reconstructed	Live tree in condition class 1 tallied for the first time at OCC 3.
2-5	2	Not reconstructed	Live tree in condition class 2-5 at OCC 3.
1	3	Culturally-killed	Culturally-killed tree that was live at OCC 2. Tree was not harvested. It can be a stump, standing, or felled. Include trees killed in logging but not felled. Not tallied on N# subplots.
1	4	OCC3 Ingrowth	Tree tallied live at OCC 3 on 10.8 feet fixed-radius plot which was not alive at OCC 2 or was< 1 inch at OCC 2. Not tallied on N# subplots.
1	5	Mortality	Tree tallied or reconstructed as live at OCC 2 but now dead. Death was natural and not due to human activity. Include partially uprooted windthrows leaning more than 45 degrees. If the dead tree qualifies as a snag, record snag information on a separate line with the same 5-digit line # and a TH 7. Not tallied on N# subplots.
1	6	Missed tree	Live tree on a remeasured subplot, which should have been tallied at OCC 2. Or a tally tree on the 10.89 feet fixed-radius which was > 1 inch DBH at OCC 2 but did not qualify for tally at OCC 2. Requires reconstruction. Not tallied on N# subplots.
1-5	7	Snag	A standing dead tree which is > 9 inches DBH and > 6.6 feet tall at OCC 3. On remeasured subplots: Leave as TH 7 a snag tallied at OCC 2 but gone at OCC 3; leave as TH 7 a snag tallied at OCC 2 but <9 inches DBH or < 6.6 feet tall at OCC 3. Do not tally snags on remeasured subplots which have "grown in" since OCC 2 and died, but tally missed snags.
1	8	Harvested	A tree tallied or reconstructed as live and > 5 inches DBH at OCC2 which has been harvested for industrial supply, firewood, local use or incidental reasons. Not tallied on N# subplots.
1-5	9	Reference	Reference only.

SECTION L.4 FOREST HEALTH MONITORING PROGRAM

SUBSECTION L.4.1 CALIFORNIA FOREST HEALTH MONITORING PROGRAM

Since 1992, Forest Health Monitoring (FHM) plots, now called Phase 3 (P3) plots, have been established on a subset of FIA Phase 2 (P2) plots across all lands in California. One tenth of these plots (approximately 100 to 110 plots) are measured each year, with around 40 to 50 of these plots being forested and field measured. These P3 plots utilize the same plot design as the P2 plots, with the same base information collected as outlined in the national core FIA field manual. In addition, a lichen survey, erosion assessment, ground and soils samples, and crown ratings for health monitoring purposes are evaluated on each P3 plot.

SUBSECTION L.4.2 OREGON/ WASHINGTON FOREST HEALTH MONITORING PROGRAM

In 1997, P3 (FHM) plots were installed at the grid locations on 207 forested plots in Oregon and 144 plots in Washington. Each year crews measure about 58 plots in Oregon and about 52 in Washington on a 5-year cycle, resulting in an eventual total of approximately 250 and 200 plots respectively. On P3 plots, tree, vegetation, lichens, ozone, and soils data are collected. P3 plots use the same 4-subplot, 24.0-foot fixed-radius design used for the P2 annual inventory.

SECTION L.5 ADDITIONAL SOURCES OF DOCUMENTATION FOR PERIODIC INVENTORIES

More information on the procedures detailed above is available from the following documents, on file at the PNW-FIA Lab in Portland, Oregon:

SUBSECTION L.5.1 CALIFORNIA

1. Field instructions for the inventory of California --1965/72, 1981-1984.
2. California PI manual for 1981-84.
3. California PI manual for 1991-94.
4. California inventory techniques manual and study plan.
5. Complete documentation for the inventory of California, 1991-1994.
6. Field Instructions for the Annual Inventory of Oregon and California, 2002
7. Forest Inventory and Analysis National Core Field Guide: Phase 2 Version 1.4 February 2000
8. Forest Inventory and Analysis National Core Field Guide: Phase 2 Version 1.5 2001
9. Forest Inventory and Analysis National Core Field Guide: Phase 2 Version 1.6 2002
10. Forest Inventory and Analysis National Core Field Guide: Version 2.0 2004
11. Forest Inventory and Analysis National Core Field Guide: Version 3.0 2006
12. Region 5 FIA Users Guide, 2000.

SUBSECTION L.5.2 OREGON AND WASHINGTON

1. Forest Survey Field Instructions; Oregon and Washington – 1961-62.
2. Manual of Field Instructions for Forest Survey and Timber Management Inventories; Oregon and Washington – 1964.
3. Field Instructions for Integrated Forest Survey and Timber Management Inventories in Oregon, Washington, and California – 1969.
4. Forest Survey Field Instructions for Oregon, Washington, and California – 1973.
5. Forest Survey Field Instructions for Southwest Oregon – 1974.
6. Forest Survey Field Instructions for West Central Oregon – 1975.
7. Forest Survey Field Instructions for Northwest Oregon – 1976.
8. Forest Survey Field Instructions for Eastern Oregon – 1977.
9. Field Instructions for the Inventory Clatsop & Columbia counties, Western Oregon – 1984.
10. Field Instructions for the Inventory of Western Oregon – 1985-86.
11. Field Instructions for the Inventory of Eastern Oregon – 1986-87.
12. Field Instructions for the Inventory of Western Oregon – 1995-97.
13. Field instructions for the Inventory of Eastern Oregon – 1998.

SECTION L.6 FOREST SERVICE ADMINISTERED LANDS: PREVIOUSLY USED REFERENCES, PROCEDURES, AND CODES

SUBSECTION L.6.1 REGION 1 AND REGION 4

PNW field crews measure plots on Region 1 (R1) Forest Service administered lands in Washington (Idaho Panhandle National Forest) and Region 4 (R4) Forest Service administered lands in California (Toiyabe National Forest). See Subsection 2.3.2 (Region 1 and Region 4 Plots), for more information about measuring plots on R1 or R4 administered lands.

- Previous Rocky Mountain Research Station (RMRS) plot layouts

  In the previous inventory, the sampling factor designated the plot layout and sampling system used. For plots with the sampling factor coded as a 20 or 40, a 5-point, 7-point, or 10-point variable radius timberland plot was established. On locations with the Sampling Factor coded as 01, 02, 05, 91, 92, or 95, a fixed-radius woodland plot was established.

A. Variable-radius plots

The LC (location center) was designated as point 1 of 5, 7, or 10 points on the plot. Points 2 through 5, 7, or 10 were distributed around the LC, and within the condition of the LC, using a triangular grid pattern with 100 foot or 70 foot intervals (Figure L.3: Previous RMRS variable-radius plot layouts).

In the previous inventory, when points 2 through 5, 7, or 10 fell into vegetation conditions different than the condition at the LC, those points were redistributed back into the LC condition. At each of the points, timber species 5.0 inches DBH and larger, and woodland species 3.0 inches DRC and larger, were tallied on a variable-radius main plot; a 20 or 40 basal area factor (BAF) angle gauge, depending on forest type, was used to select tally trees. In addition, saplings were tallied or counted, and seedlings were counted, on a 1/300 acre fixed-radius microplot centered on the point stake.

B. Fixed-radius plots

In general, fixed-radius plots were used to sample locations consisting of woodland tree species; however, some inventories used fixed-radius plots to sample locations consisting of timber species. The LC was the center point of a fixed-radius circular plot.

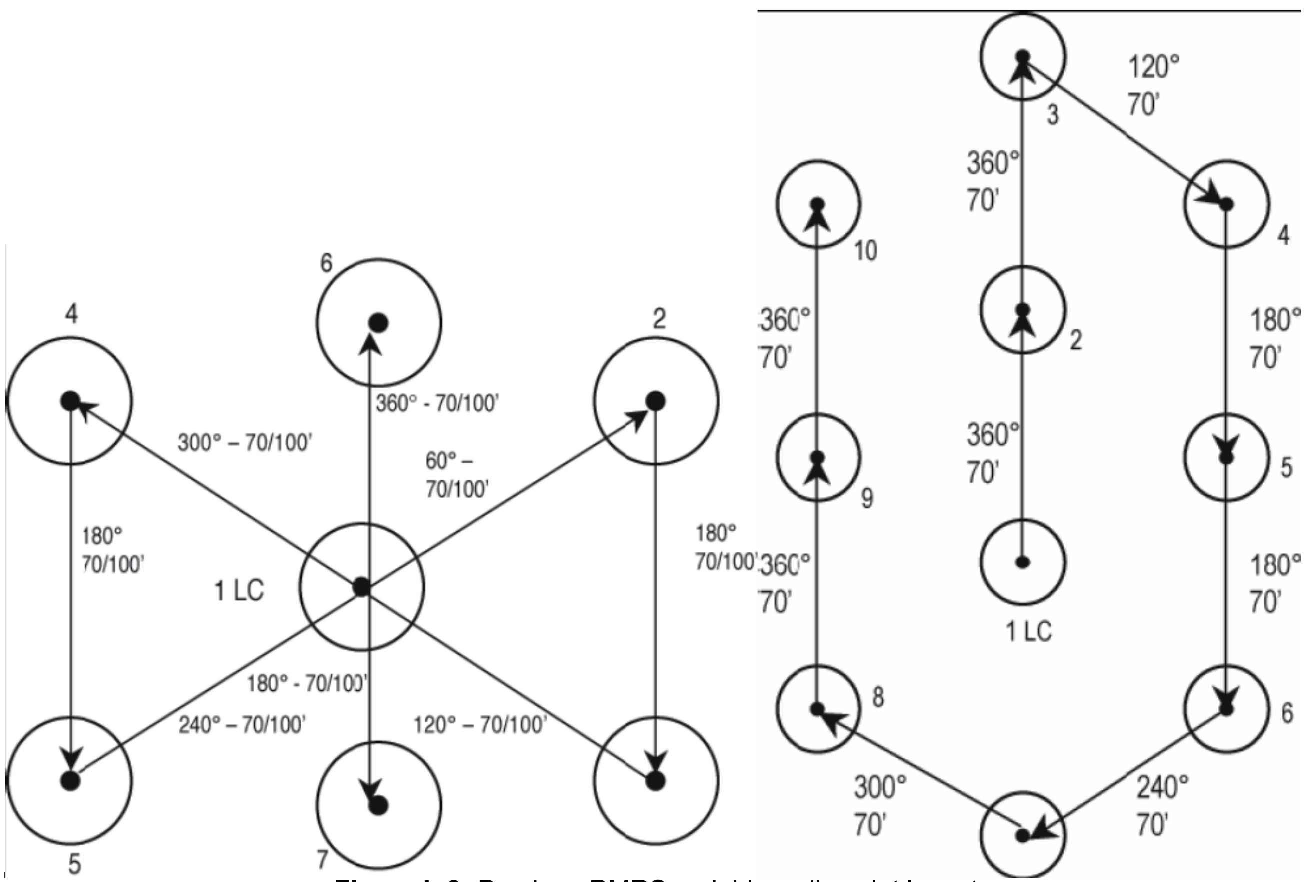


Figure L.3: Previous RMRS variable-radius plot layouts

SUBSECTION L.6.2 REGION 5 (CALIFORNIA)

A. Region 5 national forest and ranger district codes

- Used to identify plots on Forest Service administered lands **(used in R5 past data only)**

Code	Forest	Code	Forest
1	Angeles	10	Six Rivers
2	Cleveland	11	Plumas
3	Eldorado	12	San Bernardino
4	Inyou	13	Sequoia
5	Klamath	14	Shasta-Trinity
6	Lassen	15	Sierra
7	Los Padres	16	Stanislaus
8	Mendocino	17	Tahoe
9	Modoc	19	Lake Tahoe Basin

- Used to identify ranger districts **(used in R5 past data only)**:

National Forest (Administered)	Ranger District	Ranger District Number
Angeles	Los Angeles River	51
	San Gabriel	52
	Santa Clara/Mojave Rivers	53
Cleveland	Trabuco	52
	Palomar	53
	Descanso	54
Eldorado	Amador	51
	Georgetown	53
	Pacific	55
	Placerville	56
	Placerville Nursery & Forest Genetics Lab	57
Inyo	Mono Lake	51
	Mammoth	52
	White Mountain	53
	Mt. Whitney	54
Klamath	Oak Knoll	51
	Happy Camp	52
	Salmon River	54
	Scott River	55
	Goosenest	57
	Ukonom	58
Lassen	Almanor	51
	Hat Creek	53
	Eagle Lake	58
Los Padres	Monterey	51
	Santa Lucia	53
	Santa Barbara	54
	Ojai	55
	Mt. Pinos	57
Mendocino	Corning	51
	Chico Tree Improvement	52
	Stonyford	53
	Upper Lake	54
	Covelo	56
Modoc	Warner Mt.	53
	Big Valley	54
	Devil's Garden	55
	Doublehead	56

Six Rivers	Gasquet	51
	Orleans	52
	Lower Trinity	53
	Mad River	54
	Humboldt Nursery	69
Plumas	Beckwourth	51
	Mount Hough	52
	Feather River	53
San Bernardino	Arrowhead	51
	Big Bear	52
	Cajon	53
	San Gorgonio	54
	San Jacinto	55
Sequoia	Hume Lake	51
	Tule River	52
	Hotsprings	53
	Greenhorn	54
	Cannell Meadow	56
Shasta-Trinity	Yolla Bolla	51
	Hayfork	52
	Big Bar	54
	Weaverville	56
	Shasta Lake	58
	Mt. Shasta	59
	McCloud	61
Sierra	Mariposa	51
	Pineridge	53
	Kings River	54
	Minarets	55
	San Joaquin Exp.Ranger	56
Stanislaus	Mi-Wok	51
	Calaveras	52
	Summit	53
	Groveland	54
Tahoe	Downieville	53
	Foresthill	54
	Nevada City	55
	Sierraville	56
	Truckee	57
Lake Tahoe Basin	Lake Tahoe Basin	51

B. R5 Periodic Survey tree type measurement codes (Used in R5 past data only)

The type of record for each item that was measured or tallied on each subplot.

Code	Record Type
P	Prism tree record
M	Measured tree record for prism plot
N	Measured tree record for fixed area plot
S	Seedling record for fixed area plot
F	Fixed area plot tree/snag record
D	Down log record for fixed area plot
R	Root collar record for fixed area plot
X	Non-stockable plot

- Type "S" records show the number of seedlings that exist on that point. This number would be "0" if no seedlings exist on the point and the area is capable of growing trees (does not qualify as non-stockable). If the point is non-stockable, an X was recorded.

- Even if a point had no tree or down log records at all, as a minimum the point must have had either a null seedling record ("S" record with zero in the tree number field), or an "X" record. This assures that the point was counted in the statistics and not dropped.

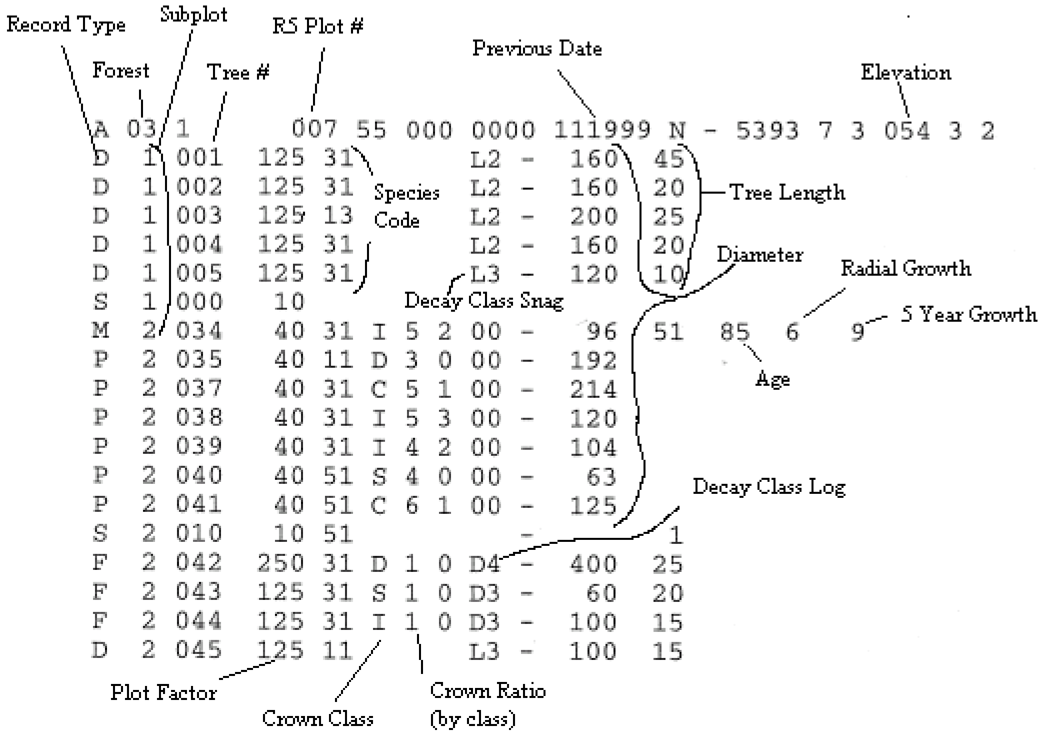


Figure L.4: Sample of R5 Survey Tree Data Sheet

C. Region 5 Periodic Survey plot vegetation profile information (used in R5 past data only)

When seedlings and sapling size conifers and hardwood trees are collected in the tree samples on the Tree Plot Record, do not collect data on these species groups as part of the understory vegetation.

Code	Record Type
C	Conifer
H	Hardwood
B	Shrub (Brush)
E	Herbaceous
G	Grasses
K	Special Features
Z	Other

- Point Number: Record the point number at which the information is being taken.
- Plot Factor: Record the fixed plot code for the area being sampled. A 1/2-acre plot is usually used, and recorded as 500. Plot sizes other than 1/2-acre can be used where appropriate.
- Species: For each species group: conifer, hardwood, shrub (brush), herbaceous, and grasses, record the three most common species in order of prevalence.
- Percent Cover: Record the percent cover on the plot. These should be recorded by cover classes.
- Height: Record the average height of the plants to the nearest foot for each species. Do not record the height of the ground cover component (herbaceous, grass, and other records).

Forest R5 Plot # Previous Date Elevation

```
V 03 1      007 55 000 0000 111999 N - 5393 7 3 054 3 2
B 01 000 0250 CEIN3    1 006 008
B 01 000 0250 ARPA9    2 002 004
B 01 000 0250 CECO2    2 004 004
B 01 000 0250 RUPA2    2 007 001
B 01 000 0250 SYMO     2 005 001
B 01 000 0250 RIB      2 008 001
B 01 000 0250 COST3    1 007 012
E 01 000 0250 ADBI     - 001 001
E 01 000 0250 UF       - 002 001
E 01 000 0250 LUP2     - 002 001
E 01 000 0250 SMST     - 001 001
E 01 000 0250 CIR2     - 001 001
E 01 000 0250 PTAQL    - 005 001
E 01 000 0250 PYPI     - 001 001
E 01 000 0250 LAT1     - 002 001
E 01 000 0250 APO      - 001 001
E 01 000 0250 HIE2     - 001 001
E 01 000 0250 GAL3     - 002 001
G 01 000 0250 UGA      - 001 000
G 01 000 0250 UGP      - 002 000
Z 01 000 0250 ROAD     - 025 000
Z 01 000 0250 ROCK     - 010 000
```

Record Type Species Percent Cover Height Subplot Plot Factor

Figure L.5: Sample of R5 survey data sheet

D. Prism factors used on past R5 survey plots: 20 or 40 BAF

Table L.1: Limiting distance tables for each factored prism of 20 and 40
Limiting Distance = Factor X DBH

BAF 20				BAF 40			
DBH	Dist in Feet	DBH	Dist in Feet	DBH	Dist in Feet	DBH	Dist in Feet
Factor = 1.994				Factor = 1.375			
.1	.2	27	53.8	0.1	0.1	27	37.1
.2	.4	28	55.8	.2	.3	28	38.5
.3	.6	29	57.8	.3	.4	29	39.9
.4	.8	30	59.8	.4	.6	30	41.2
.5	1.0	31	61.8	.5	.7	31	42.6
.6	1.2	32	63.8	.6	.8	32	44.0
.7	1.4	33	65.8	.7	1.0	33	45.4
.8	1.6	34	67.8	.8	1.1	34	46.8
.9	1.8	35	69.8	.9	1.2	35	48.1
1	2.0	36	71.8	1	1.4	36	49.5
2	4.0	37	73.8	2	2.8	37	50.9
3	6.0	38	75.8	3	4.1	38	52.2
4	8.0	39	77.8	4	5.5	39	53.6
5	10.0	40	79.8	5	6.9	40	55.0
6	12.0	41	81.8	6	8.2	41	56.4
7	14.0	42	83.7	7	9.6	42	57.8
8	16.0	43	85.7	8	11.0	43	59.1
9	17.9	44	87.7	9	12.4	44	60.5
10	19.9	45	89.7	10	13.8	45	61.9

Table L.1: Limiting distance tables for each factored prism of 20 and 40
Limiting Distance = Factor X DBH

11	21.9	46	91.7	11	15.1	46	63.2
12	23.9	47	93.7	12	16.5	47	64.6
13	25.9	48	95.7	13	17.9	48	66.0
14	27.9	49	97.7	14	19.2	49	67.4
15	29.9	50	99.7	15	20.6	50	68.8
16	31.9	51	101.7	16	22.0	51	70.1
17	33.9	52	103.7	17	23.4	52	71.5
18	35.9	53	105.7	18	24.8	53	72.9
19	37.9	54	107.7	19	26.1	54	74.2
20	39.9	55	109.7	20	27.5	55	75.6
21	41.9	56	111.7	21	28.9	56	77.0
22	43.9	57	113.7	22	30.2	57	78.4
23	45.9	58	115.7	23	31.6	58	79.8
24	47.9	59	117.6	24	33.0	59	81.1
25	49.9	60	119.6	25	34.4	60	82.5
26	51.8			26	35.8		
Factor = 1.994				Factor = 1.375			

E. R5 Past survey plot designs

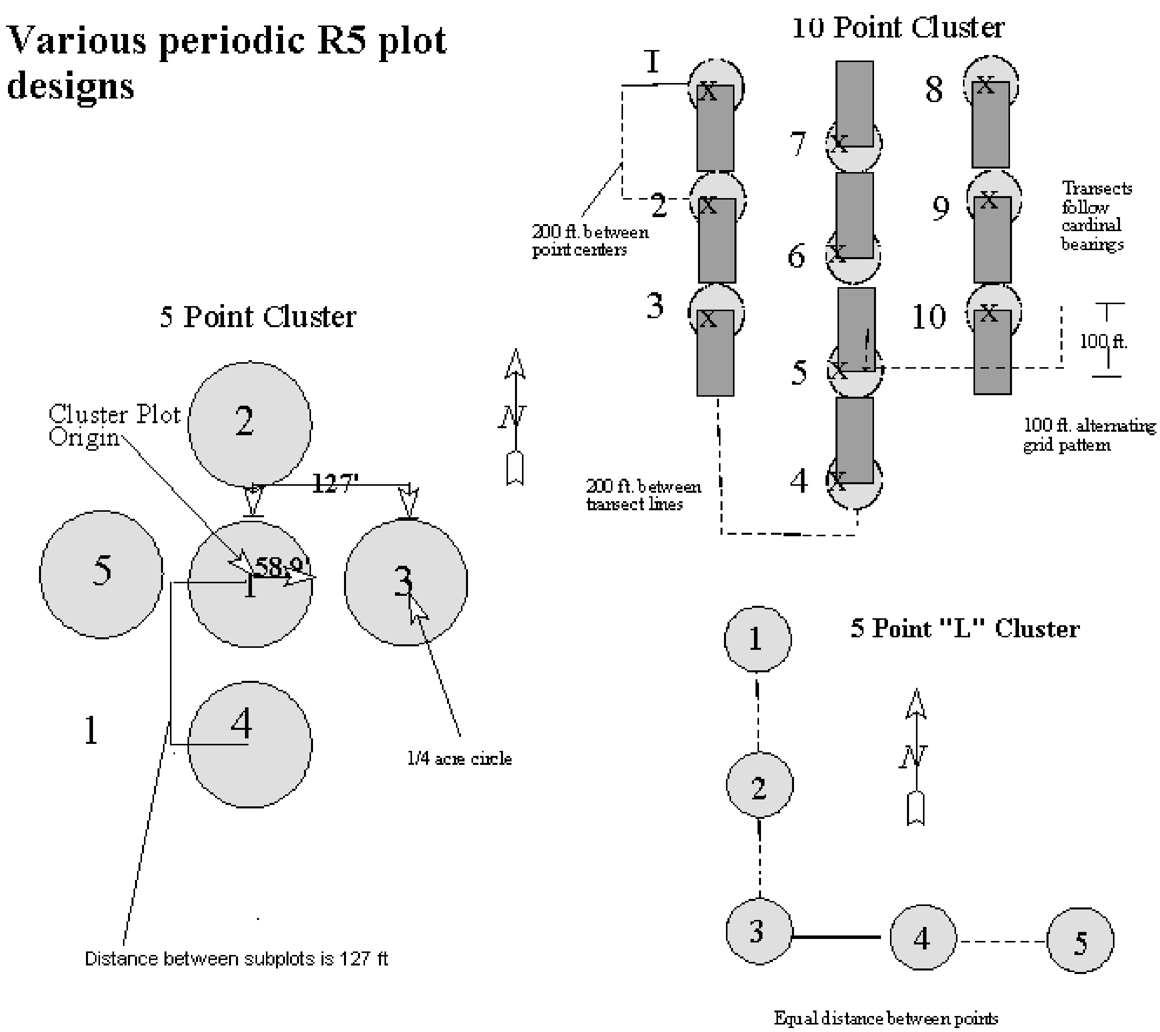


Figure L.6: R5 past plot design

F. Various sampling radii that were used during the R5 survey. See Table L.2: R5 sampling radii.

Table L.2: R5 sampling radii

Note: Plot dimensions are in horizontal distances

Plot Factor	Plot Size	Plot Dimensions
1000	1 acre (1.00)	
500	1/2 acre (.50)	66 feet X 330 feet rectangle
500	1/2 acre (.50)	83.3-foot radius circle
250	1/4 acre (.25)	66 feet X 165 feet rectangle
250	1/4 acre (.25)	33 feet X 330 feet rectangle
250	1/4 acre (.25)	58.9-foot radius circle
200	1/5 acre (.20)	52.7-foot radius circle
125	1/8 acre (.125)	33 feet X 165 feet rectangle
125	1/8 acre (.125)	41.6-foot radius circle
100	1/10 acre (.010)	37.2-foot radius circle
25	1/40 acre (.025)	18.6-foot radius circle
10	1/100 acre (.001)	11.8-foot radius circle

SUBSECTION L.6.3 REGION 6 (OREGON AND WASHINGTON)

Region 6 past survey plot designs (CVS)

Region 6 plots were installed using horizontal distances. Stake positions were located as shown in Figure L.7: Locating stake positions 1-5 (Distance and cardinal directions from stake position). Stake position 1 represents the plot center. Stake positions 2 through 5 form an annular ring around stake position 1, each in a different cardinal direction and 133.9 feet distance from stake position 1.

Traverse offsets may have been used to navigate around obstructions and one or more of the stake positions may not have been installed if:

1. A stake position is not on Forest Service administered land, or
2. A stake position on Forest Service administered land is not accessible by foot travel.

Stake positions were marked by a stake with an aluminum nail on the top of the stake to define the center of each circular subplot and the beginning of each planar subplot. A 10 inch length by 3/8th inch diameter piece of rebar was placed in the ground next to the stake unless a stake position falls on a road or trail.

Stake position reference: Stake positions are referenced by three items, including non-tally references in some cases. All references used to identify the stake position are monumented with a 3-inch by 3-inch aluminum tag (Figure L.8). Each reference tag includes the following information: reference type (SPR), PSU number, azimuth (from the stake position to the reference) and distance (direct slope distance between the nail in the stake and the head of the nail affixing the aluminum number tag to each tally tree, or to the bottom nail of the aluminum reference tag on non-tally references). The aluminum tag is attached to each reference between ground level and 12 inches above ground level with two nails, and facing the stake position. Two orange tags are also attached to the stake position reference tree at DBH or eye level, one facing the plot stake and the other facing 180 degrees from the plot.

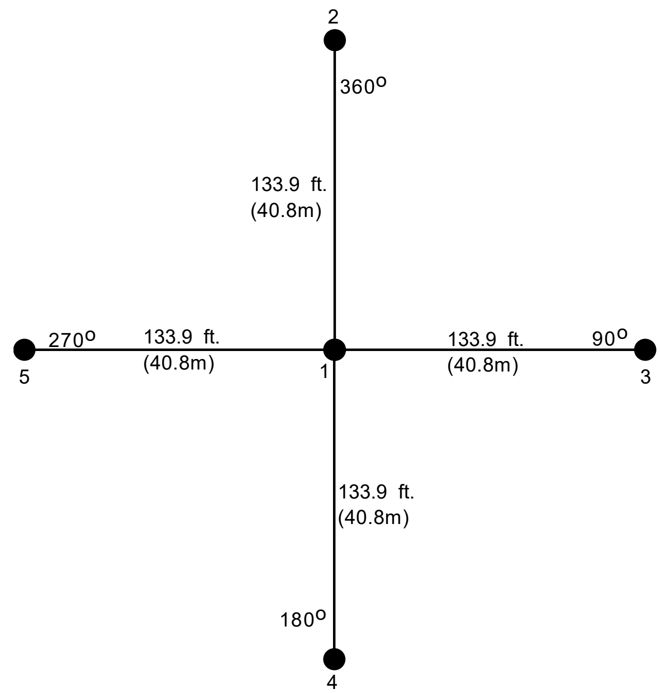


Figure L.7: Locating stake positions 1-5 (Distance and cardinal directions from stake position)

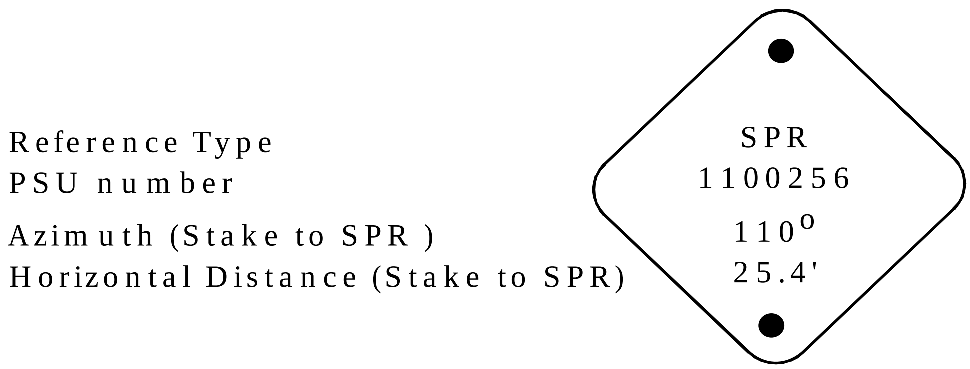


Figure L.8: Stake position reference (SPR) tag

SECTION L.7 PREVIOUS GROUND LAND CLASS

PREVIOUS GROUND LAND CLASS is downloaded/printed for plots that were classified at the previous inventory. See Item 4.2.1.26, PREVIOUS GROUND LAND CLASS, for more information.

Code	Ground Land Class	Definition
20	Timberland	Forest land which is potentially capable of producing at least 20 cubic feet/acre/year at culmination in fully stocked, natural stands of continuous crops of trees to industrial roundwood size and quality and which is not withdrawn from timber utilization. Industrial roundwood requires species that grow to size and quality adequate to produce lumber and other manufactured products (exclude fence posts and fuel wood which are not considered manufactured). Timberland is characterized by no severe limitations on artificial or natural restocking with species capable of producing industrial roundwood.
41	Other forest-rocky	Other forest land which can produce tree species of industrial roundwood size and quality, but which is unmanageable because the site is steep, hazardous, and rocky, or is predominantly nonstockable rock or bedrock, with trees growing in cracks and pockets. Other forest-rocky sites may be incapable of growing continuous crops due to inability to obtain adequate regeneration success.

42	Other forest-unsuitable site (wetland, subalpine or coastal conifer scrub) (CA only)	Other forest land which is unsuited for growing industrial roundwood because of one of the following environment factors: willow bogs, spruce bogs, sites with high water tables or even standing water for a portion of the year, and harsh sites due to extreme climatic and soil conditions. Trees present are often extremely slow growing and deformed. Examples: whitebark pine, lodgepole, or mountain hemlock stands at timberline; shore pine along the sparkling blue Pacific Ocean (Monterey, Bishop, and Douglas-fir); willow wetlands with occasional cottonwoods present; Sitka spruce-shrub communities bordering tidal flats and channels along the coast. Includes aspen stands in high-desert areas or areas where juniper/mountain mahogany are the predominate species.
43	Other forest-pinyon-juniper	Areas currently capable of 10 percent or more tree stocking with forest trees, with juniper species predominating. These areas are not now, and show no evidence of ever having been, 10 percent or more stocked with trees of industrial roundwood form and quality. 10 percent juniper stocking means 10 percent crown cover at stand maturity.
44	Other forest-oak	Areas currently 10 percent or more stocked with forest trees, with low quality forest trees of oak, gray pine, madrone, or other hardwood species predominating, and which are not now, and show no evidence of ever having been, 10 percent or more stocked with trees of industrial roundwood form and quality. Trees on these sites are usually short, slow growing, gnarled, poorly formed, and generally suitable only for fuel wood. The following types are included: blue oak, white oak, live oak, oak-gray pine.
45	Other forest-chaparral	Areas covered with heavily branched dwarfed trees or shrubs, usually evergreen, the crown canopy of which currently covers greater than 10 percent of the ground. The principal species are dwarf *Quercus*, *Cercocarpus* (except *Cercocarpus ledifolius*), *Garrya, Ceanothus, Arctostaphylos, Baccharis, and Adenostoma*. Areas in which the predominate cover is *Artemisia, Purshia, Gutierrezia, Opuntia*, or semi-desert species are considered nonforest.
46	Other forest-unsuitable site (OR & WA Only)	Other forest land which is unsuited for growing industrial roundwood because of one of the following environment factors: willow bogs, spruce bogs, sites with high water tables or even standing water for a portion of the year, and harsh sites due to climatic conditions. Trees present are often extremely slow growing and deformed. Examples: whitebark pine or mountain hemlock stands at timberline, shore pine along the Pacific Ocean, willow wetlands with occasional cottonwoods present, and sitka spruce-shrub communities bordering tidal flats and channels along the coast. Aspen stands in high-desert areas, or areas where juniper/mountain mahogany are the predominate species, are considered other forest-unsuitable site.
48	Other forest-cypress (CA Only)	Forest land with forest trees with cypress predominating. Shows no evidence of having had 10 percent or more cover of trees of industrial roundwood quality and species.
49	Other forest-low site	Forest land capable of growing crops of trees to industrial roundwood quality, but not able to grow wood at the rate of 20 cubic feet/acre/year. Included are areas of low stocking potential and/or very low site index.
61	Cropland	
62	Improved pasture	
63	Natural range land	Includes abandoned farmland.
64	Farmland	Includes homesteads.
65	Marsh	
66	Cultural nonforest stringer	16.5-foot wide and wider constructed roads, power lines, pipelines and railroads.
67	Urban	Town sites and areas of clustered suburbs, residential industrial buildings. (Forest 7.5 acres or more in urban areas are classed as forest land).
68	Naturally nonvegetated	Barren rock, sand, and glaciers.
69	Christmas tree lands	Includes nurseries.
92	Water	Includes lakes 1.0 to 40 acres and streams 30 to 660 feet wide.

APPENDIX M DISEASE KEYS

SECTION M.1 GENERAL ROOT DISEASE SYMPTOMS

Root disease centers or "pockets" usually appear as patches or groups of dead and dying trees. Trees in all stages of decline (long-dead trees, recent kills, declining live trees) are usually present; old dead trees are found at the center of the pocket, while declining trees occur near the leading edge of the expanding infected area. In contrast, bark beetle group kills usually consist of trees that died suddenly and simultaneously. Wind thrown trees with decayed roots broken off close to the root collar (root ball) may be evident, except for Black Stain root disease and Annosus in pines, which do not form root balls. Individual trees affected by root disease may exhibit the following above-ground symptoms:

1. Reduced height growth increment (as compared to neighboring healthy trees). This results from gradual decline as the root system is slowly destroyed. Look for progressively short internodes of the terminal leader.
2. Sparse, yellow crowns. Trees infected by root disease fungi often lose needles; needles that remain are often yellow (chlorotic). The crown appears "transparent".
3. Distress cone crop. In the later stages of decline, infected trees may produce an abundant crop of unusually small cones.

SECTION M.2 INDIVIDUAL DISEASE DESCRIPTIONS

Laminated root disease

Affects all conifers to varying degrees. The most susceptible species are Douglas-fir, true firs, and mountain hemlock. Wind thrown trees have decayed roots broken close to root collar, forming root balls. When duff and soil are removed to expose roots, look for grey-white mycelium on surface of roots; these mycelium penetrate only the outermost few millimeters of bark, forming a crusty sheath that cannot be rubbed off easily. In comparison, *Armillaria* will have white mycelium on the inside of roots, between the bark and wood.

Laminated root rot is most easily identified by examining decayed wood which can be found on root balls or in stump hollows. Decayed wood separates readily along annual tree growth rings, hence the name "laminated" root rot. Yellowish-brown decayed wood is usually dry and contains numerous 1 millimeter-long oval pits. Reddish-brown wiry whiskers can usually be found between layers of decayed wood and are best seen with a 10X magnifying lens. These whiskers are the best diagnostic indicator of laminated root rot.

***Armillaria* root disease**

Affects all conifers and hardwoods. Root balls on fallen trees may occur in disease centers. Heavy resin flow near base of tree is common. Chopping into root collar or root will reveal white, fan-shaped mats of mycelium between wood and bark. The mats have a texture that may remind one of peeling partially-dry latex paint off a glass surface (if one has ever done that). The mycelium can penetrate a few millimeters into the inner bark, but never evident on the outside of the bark or root surfaces. In comparison, laminated root rot has grey-white mycelium on the outside. Decay in root balls and stumps is soft, spongy, yellowish, usually wet, stringy, and often contains numerous black lines. Honey-colored mushrooms may be present at the base of infected trees and stumps. Black thread-like structures (rhizomorphs) may be present in decaying wood or in infected roots.

Black Stain root disease

Pines are the primary host in eastern Oregon. Hemlocks and Douglas-fir can also be affected. Infected trees occasionally have resin flow at the base. Brown to black streaks in the sapwood--usually in the last 3 to 4 annual rings--of the root collar and roots are the best indication of the disease. You must chop into the wood to diagnose Black Stain; it does not occur in or on the bark or bole of roots. Root balls are not present in Black Stain disease centers (unless another root disease is also present) because the fungus does not rot roots--it plugs sapwood tracheids causing trees to die standing. Black Stain is most common in young plantations.

Annosus root disease

Most common on true firs, pine, and hemlock. Most difficult to identify of the major root diseases. Look for groups of trees that have not died all at the same time. Bark beetles usually will be present, especially in true fir, ponderosa pine, and sugar pine. Root balls may be present in disease centers, particularly in true fir stands. In true firs, the decayed wood is soft, spongy, white (often with silvery cast) with black flecks (like small wild rice grains scattered through the decay). Small bracket-shaped conks may be present in stump hollows or under the duff near the root collar of infected dead trees or stumps. Annosus is often identified by default--if it is not one of the other root diseases, and if the symptoms suggest root disease and the decay is similar to the description, then it is probably Annosus. In pines, small "button" conks may be present on the root collar beneath the duff. The roots of infected pines are usually resin-soaked.

SECTION M.3 LISTING OF DISEASE- TOLERANT SPECIES BY ROOT DISEASE

Root disease	Disease-tolerant species
Laminated root rot	Larch, pines, cedars
Armillaria root disease	Larch, lodgepole pine. On a few sites, ponderosa pine may be susceptible. If this is the case, only larch and lodgepole should be considered tolerant.
Annosus root disease	On sites with abundant true fir, lodgepole and ponderosa pines are tolerant. On ponderosa pine sites, larch and Douglas-fir are tolerant.

APPENDIX N RESERVED AND ADMINISTRATIVELY WITHDRAWN STATUS BY OWNER AND LAND DESIGNATION

SECTION N.1 RESERVED AND ADMINISTRATIVELY WITHDRAWN STATUS

Note: Ordered by owner code, national to local, and reserve status, with actual and candidate areas grouped

OWNGRP	OWNCD	Land designation (and example)	RESERVCD[c]	Designated by	Comments
10,20	all	Wilderness (Cohutta Wilderness, GA/TN)	1	Congress	Some of these are within National Parks, and are reserved either way.
10,20	all	Wilderness Study Area (Browns Canyon WSA, CO)	0	Congress, proposed	These are areas that were established by Congress during the RARE II process or in other bills. They can be/have been "released" by Congress at a future date, but until then are managed by the agency as wilderness.
10,20	all	Recommended Wilderness (Lionhead recommended wilderness, MT)	0	Federal unit, recommended	Areas recommended as wilderness through land management planning are managed as wilderness until Congressional action or revised Forest Plan direction.
10	all	Primitive Area (Blue Range Primitive Area, AZ)	0	Federal unit, recommended	Managed as Wilderness pending possible designation
10,20	all	Proposed Wilderness	0	not designated; recommended by legislators, interest groups, etc.	These can be proposed by anybody anywhere and the size and borders are very fluid up until the time the bill is passed (or not). No apparent impact on current management.
10,20	all	National Monument/National Volcanic Monument (Grand Staircase-Escalante, UT)	1	Executive Order or Congress	Agencies have treated these executive orders as having the force of law, with modifications requiring an act of Congress.
10,20	all	National Recreation Area (Hell's Canyon NRA, OR/ID)	1	Congress	Although the legislation of some NRAs do not preclude wood production, most do and given the emphasis is likely to be minor, so default to reserved.
10,20	all	Wild and Scenic Rivers (wild, scenic or recreational classification) (Au Sable River, MI)	1	Congress	Wood production is not an objective for any wild and scenic river (FSM 2354.42d). Harvest in segments classified as wild is excluded except under emergency conditions; harvest in segments classified as scenic or recreational is only allowed to further river management objectives. If a map of the area or other information is unavailable, use 1/4 mile on either side of the river on federal land (1/2 mile in Alaska).
10,20	all	Wild and Scenic Study Rivers (wild, scenic or recreational classification) (White Salmon River, WA)	0	Federal admin. unit or Congress, proposed	Includes "eligible" or "suitable" study rivers. Wood production is not allowed and harvest restrictions are similar to designated rivers (FSH 199.12 82.51). Study rivers have a default area of 1/4 mile from either side of the river on federal lands.
10	all	National Scenic Area (Mt. Pleasant, VA)	1	Congress	Although the legislation of some NSAs do not preclude wood production, most do and given the emphasis is likely to be minor, so default to reserved.
10	all	Experimental Forest (Hubbard Brook, NH)	0	Congress/WO	Purpose includes research and management

10	all	Experimental Range (Santa Rita, AZ)	0	Congress/WO	Purpose includes research and management
10	all	Research Natural Area (Limestone Jags, AK)	0	NFS unit	RNAs may be established through coordination with WO, but land planning done at NF level
10	all	Roadless Area (Carribean NF, PR)	0	NFS unit	Roadless Rule was established through coordination with WO, but land planning and future changes are done at NF level
10	all	Special Interest Area (Cape Perpetua, OR)	0	NFS unit	
10	all	Special Recreation Area (Bell Smith Springs, IL)	0	NFS unit	
10	all	Suitable for Timber Harvest	0	NFS unit	Areas designated in Forest Plans as suitable for harvest for a variety of purposes, but not in the timber base
10	all	Suitable for Timber Production	0	NFS unit	Areas designated in Forest Plans as in the timber base, and managed for multiple use
20	21	ALL National Park Service designations on federal land	1	Executive Order/ Congress	Some NPS units/designations are on private land: Canyon de Chelly, parts of Lake Roosevelt, Ebey's Landing, and National Historic Sites; these are NOT reserved.
20	22	Areas of Critical Environmental Concern (High Rock Canyon, NV)	0	BLM unit	Authorized by Congress in FLPMA to protect significant areas, designated by management units
20	22	National Conservation Areas (Kings River, CA)	0	Congress	NCAs are focused on limited resources for protection, many have "multiple use" as a goal
20	23	ALL Fish and Wildlife Service designations on federal land	1	Executive Order/ Congress	Not clear if all FWS refuges are designated by Congress or not, but timber production is not goal of the agency.
10,20,30	all	National Natural Landmark (Caledon Natural Area, VA)	0	USDI	Designated by USDI but managed/owned by various public entities for a wide range of conservation purposes. Ignore the landmark status and use the designation given by the land-owner to determine status .
20	25	National Estuarine Research Reserve System	1	Congress	Established in Coastal Zone Management Act of 1972 for research and protection; managed by NOAA
30	all	State or local Parks	1	State or local Parks Dept	Rarely specifically designated by law, but laws defining agency goals preclude management for timber production
30	all	State or local Wilderness	1	State or local Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Wilderness preclude management for timber production.
30	31	State Wild River	1	State Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Wild Rivers preclude management for timber production.
30	all	State or local Reserve	1	State or local Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Reserves preclude management for timber production.
30	31	State Forests	0	State Forestry Dept	Usually managed by state agencies for multiple values, including production of timber products
40	all	All private lands	0		All private lands, including those owned by some conservation groups, those with conservation easements, and tribal protected areas, are considered unreserved

a. OWNGRP: Owner group code. Ownership (or the managing Agency for public lands) of the land in the condition class; A broader group of landowner classes than OWNCD.
b. OWNCD: Owner class code. The class in which the landowner (at the time of the inventory) belongs.
c. RESERVCD: Reserved from timber production. Timber harvest may still be allowed for other land management objectives. See description for Reserved Status.

APPENDIX O QUALITY ASSURANCE

The goal of the FIA Quality Assurance (QA) program is to ensure that all resource inventory data are scientifically sound, of known quality, and are thoroughly documented. The QA process consists of two components: **quality control**, which includes the operational techniques used to reduce random and systematic errors, and **quality assessment**, to evaluate the program performance with respect to established standards.

SECTION O.1 QUALITY CONTROL

Quality control (QC) includes operational techniques such as: identifying and adopting standards for producing quality products, crew training, data collection field checks, data error and completeness checking, data editing, identifying protocol in need of clarification, developing efficient data flow procedures, software bug tracking, and assuring consistency through well documented procedures guides.

SUBSECTION O.1.1 TYPES OF QC CHECK PLOTS

Hot check - An informal QC plot inspection done as part of the ongoing training and monitoring process. A QA staff inspector is present on the plot with the production crew and provides immediate feedback regarding protocol interpretation and measurement tolerance compliance. Data errors detected during the inspection are corrected in the production data. Hot checks are identified in the data by coding QA STATUS = 7, Item 4.3.1.2.

Cold check - A formal QC plot inspection with three objectives: 1) To promote consistency in interpretation and application of data collection field procedures, 2) To identify training needs or protocols in need of clarification, and 3) To assess and track the quality of production crews. Cold checks are conducted on production plots by QA staff with completed production plot data in hand. Inspector measurements are recorded in a cold check data file. Data errors detected by the QA during the cold check are not corrected in the production data. Historical data files for cold checks are obtained from the QAQC menu on the MIDAS website and will have a QAC file extension. Cold checks are identified in the data by coding QA STATUS = 2.

SUBSECTION O.1.2 PNW QC CHECK PLOT FREQUENCY

Two hot checks per FIA crew occur within one month of the start of the field season; subsequent hot checks per crew may occur as deemed necessary by the QA Coordinator. Cold checks occur throughout the field season, with multiple cold checks completed for each crew. The overall number of each type of check plot conducted meets or exceeds national FIA guidance.

SECTION O.2 QUALITY ASSESSMENT

Quality assessment evaluates data variability and compliance with established standards, and aids in identifying QC needs. The assessment procedure compares production plot data with an independent "blind" measurement of the same plot to evaluate the relative uncertainty associated with FIA field collected data. This is valuable to anyone relying on FIA data for their assessments. Blind data can also be used to determine whether measurement quality objectives (MQO), consisting of a tolerance and a compliance rate, are being met and if they are appropriate. Blind data can address a variety of questions, such as: Is a large diameter tree more likely to have a larger measurement variation than a small diameter tree?

SUBSECTION O.2.1 BLIND PLOTS

The national FIA program direction is to measure 3% of the total number of field visited plots as blind plots. Blind plots are selected randomly from the entire population of sampled (i.e. PLOT STATUS = 1 or 2) plots and are measured by a second crew within a month of the production measurement. The second crew may be comprised of production staff, QA staff, or both. Production data are not available to the second crew. BLIND PLOTS ARE NOT CHECK PLOTS, as they are not used to evaluate crew quality; both datasets are considered to be correct measurements.

SUBSECTION O.2.2 BLIND PLOT REQUIREMENTS

PLOTS ARE RANDOMLY SELECTED: All field plots are assigned a random rank order number by state at the beginning of the field season. Periodically, completed plots are selected for blind plots by the QA or State Coordinator based on their rank order.

INDEPENDENT MEASUREMENT: Data are recorded independently without referring to the production crew data. Both data sets are maintained unchanged as independent samples.

ENTIRE BLIND PLOTS: All measurements required for the production visit, except site trees, are collected by the blind crew.

PARTIAL BLIND PLOTS: Partial blind plots are only measured by QA staff in conjunction with a cold check. All plot, subplot, and condition level data are collected; all data are measured on two or more subplots. The subplots measured on partial blind plots must be randomly selected (measurement order assigned at the beginning of the field season), and the blind measurement must be completed before the cold check is started.

TIMING: Blind plots can be measured at any time during the field season or panel completion, but should be completed within one month of the production measurement to avoid the confounding effects of seasonal changes on the plots.

SUBSECTION O.2.3 OFFICE PREPARATION

State and QA coordinators are responsible for scheduling and assigning blind plots. For each plot, they ensure that no members of the production crew, or anyone with knowledge of production measurements, are on the blind crew.

To prepare the plot for the blind crew, a new plot jacket is created and labeled as a blind plot. Land owner access information, historical data, and all other information available to the production crew is transferred to the new plot jacket, along with a plot card that is blank except for plot location directions, reference point information, and any safety notes copied from the production plot card. The production plot card and data printout remain in the production jacket.

SUBSECTION O.2.4 FIELD PROCEDURES FOR ENTIRE BLIND PLOTS

The blind plot crew must obtain the historical data file from the QAQC menu on the MIDAS website; the file will have a QAB extension designating it as a blind plot. Do not use a historical data file obtained from the FIELD menu; using a production historical data file will result in MIDAS errors. Record all landowner contact events in the National Ownership Database.

No extra care should be exercised when measuring a blind plot; if a measurement is normally estimated or taken quickly on production plots, it should be done the same on blind plots.

Once on plot, all measurements required for the production visit (except site trees) are collected. Observe the following:

- Complete a new plot card
- Code item QA STATUS = 6 (blind plot).
- Regardless of whether the production plot was a new installation or a remeasurement, use the established plot, macroplot, and microplot centers even if you disagree with their location.
- If subplot or microplot pins are no longer in the ground, make a subplot level note. If both the subplot and microplot pins are no longer in the ground:
    - On remeasurement plots, re-place the pins following the directions in Subsection 2.2.4, PC Stake or Subplot/Microplot Pin Missing or Moved.
    - On new installations (i.e. the annual footprint was established for the first time by the production crew) re-place the pins using all available clues: witness trees, all numbered trees and saplings. Note: it is important that subplot and microplot pins re-placed without reference to historic witness information are removed when the blind measurements are completed.
- The blind crew does not change any monumentation. Use production tree tag numbers. Do not add tree number tags or nails on any "missed" trees encountered (make up the tree tag number), and do not remove monumentation from "added" trees not tallied by the blind crew.
- Measure tree diameters at the nails left by the production crew.

- When collecting ages on trees that were bored by the production crew, do not use the production core (re-bore).
- Do not measure site trees.
- Place DWM transects where the production crew placed them (try to locate production flagging and duff/litter pit). If there is no indication of production placement, place them as specified in the DWM chapter.
- Record vegetation profile cover and structure estimates as seen at the time of the blind visit. If it is apparent that trampling of understory vegetation has occurred, make a subplot level note.

Edit and transmit the plot to the MIDAS server as usual (including a new edit sheet), and submit the blind plot jacket to the QA staff. The QA will then combine the contents of the blind and production jackets into the production jacket.

APPENDIX P GPS OPERATING GUIDE

SECTION P.1 OVERVIEW

Global Positioning Systems (GPS) technology uses signals from satellites to triangulate and compute the coordinates of locations on the ground. PNW-FIA uses coordinates to correlate plot information with remotely sensed imagery and data, and to relocate plots at future inventories.

GPS units can also be used to create and navigate to waypoints. A waypoint is a fairly precise location that a GPS user may assign a number or label to identify. Waypoints can be entered into the GPS unit to navigate to, or they can be recorded while navigating to mark a particular location.

PNW-FIA uses the UTM (Universal Transverse Mercator) coordinate system. This format includes the following information:

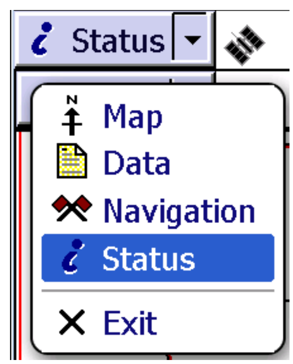
- Zone, a 2 digit number (01-60) with a letter (C-X) attached. All zones in the western U.S. will be a combination of the numbers 10 and 11, and letters U, T, or S.
- Easting, a seven digit number (the first digit is often a zero) that represents distance from the eastern boundary of the particular zone.
- Northing, a seven digit number that represents distance north of the equator (northing numbers are usually instrumental in determining what zone the coordinates are in).

PNW-FIA uses Trimble GEOXH6000, Trimble Geo7x, Javad Triumph 2, and Garmin Oregon 400t GPS receivers.

SECTION P.2 INSTRUCTIONS FOR OPERATING THE TRIMBLE UNIT

The TerraSync program is used on the Trimble to collect GPS data. The TerraSync software is arranged in the following five sections:

Tapping the Section box displays the five program sections



- Map (displays map view of waypoints and current position)
- Data (screens used for GPS data collection)
- Navigation (screens used for navigation and waypoint creation)
- Status (displays current coordinates, elevation, precision of position)
- Exit (used to close the TerraSync program)

One of these sections is always active and visible. The Section list button shows the section that is currently active. You can move between sections at any time without closing any open forms or screens. To switch to a different section, tap the Section list button and then tap the section you want from the drop-down list.

For general questions on operation of the Trimble, crews can contact the FS GPS Front-Line Support at 1-866-560-6200 toll free and by email at support@geoposition.com.

SUBSECTION P.2.1 COLLECTING A SUBPLOT ROVER FILE WITH THE TRIMBLE UNIT

For each of the 4 subplots AT LEAST 15 minutes (900 observations) are collected. Please collect more readings if possible.

1. Turn on the Trimble by depressing the green button.
2. On the screen, tap "GeoXH" for the GeoXH6000 or “TerraSync” for the Geo7x.
3. For the GeoXH6000, tap "GNSS Application Launcher" to start the TerraSync data collection program.
4. Wait until a position is displayed instead of "?" in the "Status" screen.
5. Tap "Data" in the drop down menu.
6. In the File Name box, enter the rover file name in this format:

For production plots: st-cty-plot%-sp# (e.g. ca-029-05247-sp1 where st is the 2 character state code, cty is the 3 digit county code (including any leading zeros), plot% is the 5 digit plot number (including any leading zeros), sp# is "sp" followed by the 1 digit subplot number 1-4).

For cold and blind plots: Add a C or a B to the end of the file name (e.g. ca-029-05247-sp1C, ca-029-05427-sp1B). This will prevent the cold or blind rover files from overwriting the production rover file when loaded to the server.

7. Tap "Create" at the bottom of the screen.
8. At this point the next step depends on which unit you have. For the Geo7x, position the unit as described below and tap "Point_generic". The Geo7x will immediately start recording positions so make sure it is properly located. If an offset is necessary, it can be entered while the unit is recording. For the GeoXH6000, tap "Point_generic". This unit will not start recording until you tap the "Log" button on the next screen, described in step 18.
9. Position the Trimble unit so the antenna patch is relatively level and is touching the subplot center or just above it. Elevating it on a pack above vegetation is ideal. The unit should not be within 5 feet of a large diameter tree (over 20" DBH) if possible. The unit may be placed up to 30 ft from the subplot center. The unit should not be placed under heavy understory if possible.
10. It is preferable not to offset but if an offset is necessary, measure the horizontal distance (nearest 1/10th ft) and azimuth (0-359, nearest degree) FROM the center of the internal Trimble antenna to the subplot center. Record these values in the GPS screen in MIDAS as described in Subsection 4.4.4.

11. On the GeoXH6000, tap "Log" at the bottom of the screen to start logging satellite data. Notice that the number of recorded positions is displayed in the upper right corner of the screen.
12. Leave the Trimble collecting data for AT LEAST 15 minutes (at least 900 observations). If the unit is not in the way & there is adequate battery life, let it collect data the entire time you're on the subplot. The more readings recorded the better.

    Note: Don't stand over the unit as your body will block GPS signals.

13. After at least 15 minutes, tap "Done" at the bottom of the screen.
14. Tap "Close" at the bottom of the screen.
15. Tap "Yes" to confirm closing the rover file.
16. Tap "Data" in the upper left corner of the screen.

17. Tap "Exit" from the drop down menu to exit the Terrasync program.

GPS data collection for the subplot is completed. Repeat this procedure for remaining subplots.

NOTE: Completely shutdown the Trimble power to conserve battery life between subplots. To do this, press and hold the green power button for 3 seconds, then tap "Shutdown".

SUBSECTION P.2.2 DISPLAYING COORDINATES FOR PLOT CENTER (OPTIONAL)

Crews may choose to use the Trimble instead of the recreational grade GPS unit for realtime (not post-processed) plot center coordinates:

1. Turn on the Trimble by depressing the green button.
2. Tap "GeoXH" on the screen, or “TerraSync” on the Geo7x.
3. Tap "GNSS Application Launcher" to start the TerraSync data collection program.
4. If the Terrasync is already running, select "Staus" from the drop down menu in the upper left corner of the screen.
5. Wait until a position is displayed instead of "?" in the "Status" screen.
6. The current position (in UTM meters) and elevation (MSL, ft) is displayed under the satellite Skyplot graphic. The estimated horizontal precision of the position in feet is shown in the upper right corner of the screen with a double-ended arrow below the value.
7. Wait until the precision value drops below 70 feet, then enter the PC coordinates, elevation and precision in MIDAS on the Allegro.

SUBSECTION P.2.3 NAVIGATING WITH WAYPOINTS

Crews may use the Trimble to create a waypoint or navigate to a way point. To create a waypoint:

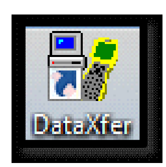
1. With TerraSync already running, select "Navigation" from the drop down menu in the upper left corner of the screen.
2. To create a waypoint, tap the "Navigate" drop down menu (below the "Nav" menu in top left corner of screen) and tap "Waypoints".
3. Highlight the waypoint file that will be used, then tap "Open", alternatively, tap "New" to create a new waypoint file.
4. Tap "Options", then "New" from the drop down menu.
5. Enter the waypoint name.
6. Tap North, then enter the waypoint value.
7. Tap East, then enter the waypoint value.
8. Tap "Altitude", then enter the waypoint elevation.

   Alternatively, to use the current GPS location, tap "Create From" in the upper right corner, then tap "GNSS".

9. If an offset is needed (e.g., to create a waypoint from plot center to subplot 4, enter 240 degrees and 120 feet), enter the azimuth and horizontal distance (use 0.00 vertical distance default value).
10. Tap "Done".
11. To navigate to an existing waypoint, tap "Waypoint", then highlight the target waypoint.
12. Tap "Nav" in the upper left corner of the screen, then select "Navigate" from the second-row drop down menu.
13. The navigation screen appears, with the distance and heading from the current position to the selected waypoint, along with an arrow indicating the direction to move to get to the waypoint.
14. Tap "Nav" in the upper left corner of the screen, then "Map" from the drop down menu to see the map view of the waypoints and current position.

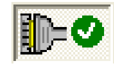
SUBSECTION P.2.4 DOWNLOADING TRIMBLE ROVER FILES TO A LAPTOP

The following instructions are for downloading the Rover files from theTrimble.

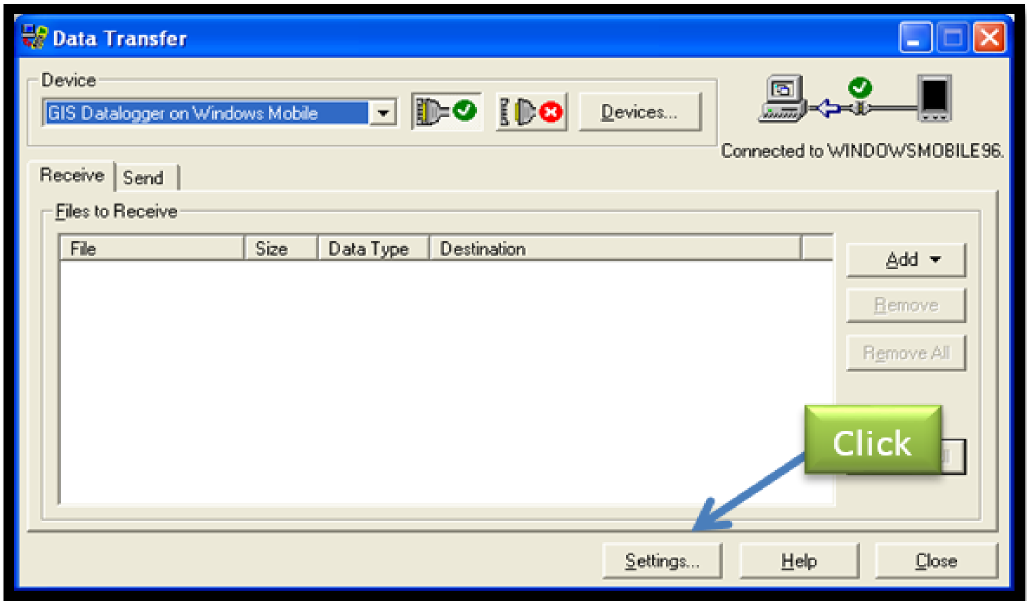


1. Connect the Trimble to the laptop with the Trimble USB cord.
2. Turn on the Trimble by pressing the green power button.

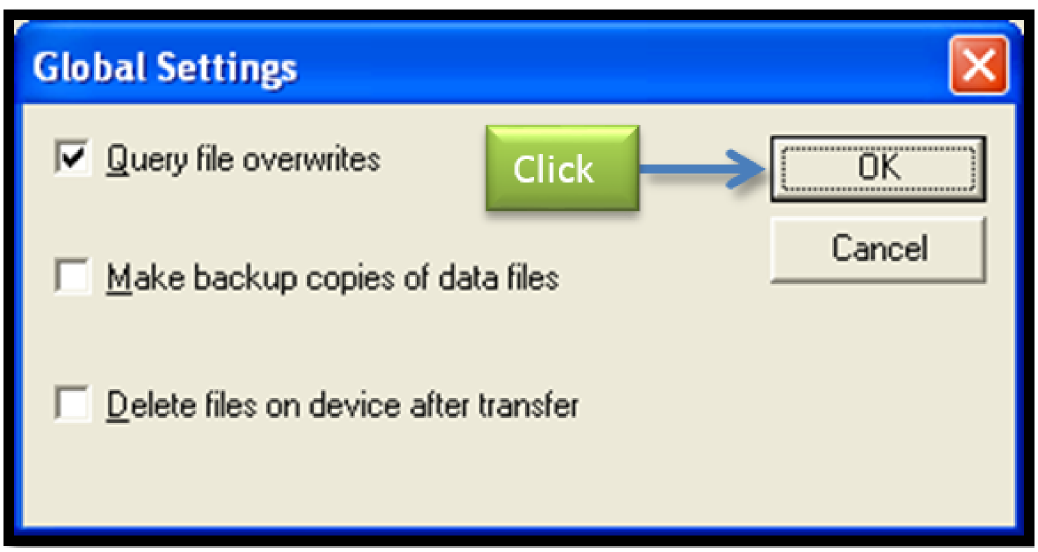
3. Start the Data Transfer program by double clicking the "DataXfer" shortcut on the desktop or by clicking on the Windows "Start" icon, then "All Programs", "Trimble Data Transfer", and “Data Transfer”.
4. The Trimble will automatically connect, if not Select your device "GIS Datalogger on Windows Mobile" from the drop down menu and click the green checked button to connect.



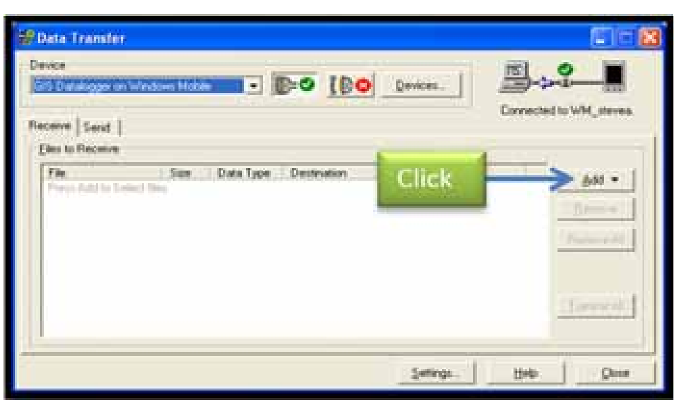
5. Make the following setting in the Trimble Data Transfer Utility to only create *.SSF files on the laptop: Click "Settings" in the Data Transfer Utility



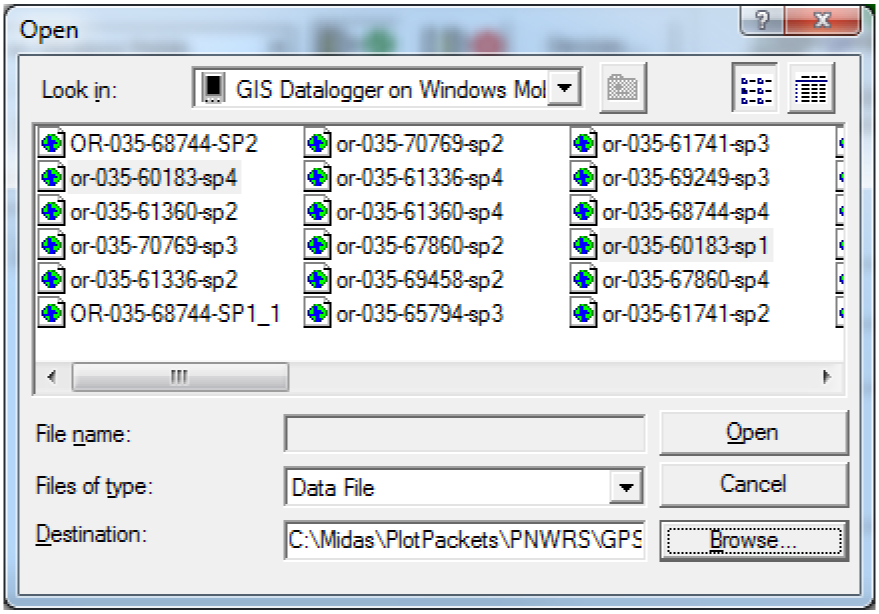
6. Check the ‘Query file overwrites’ box, then click “OK”



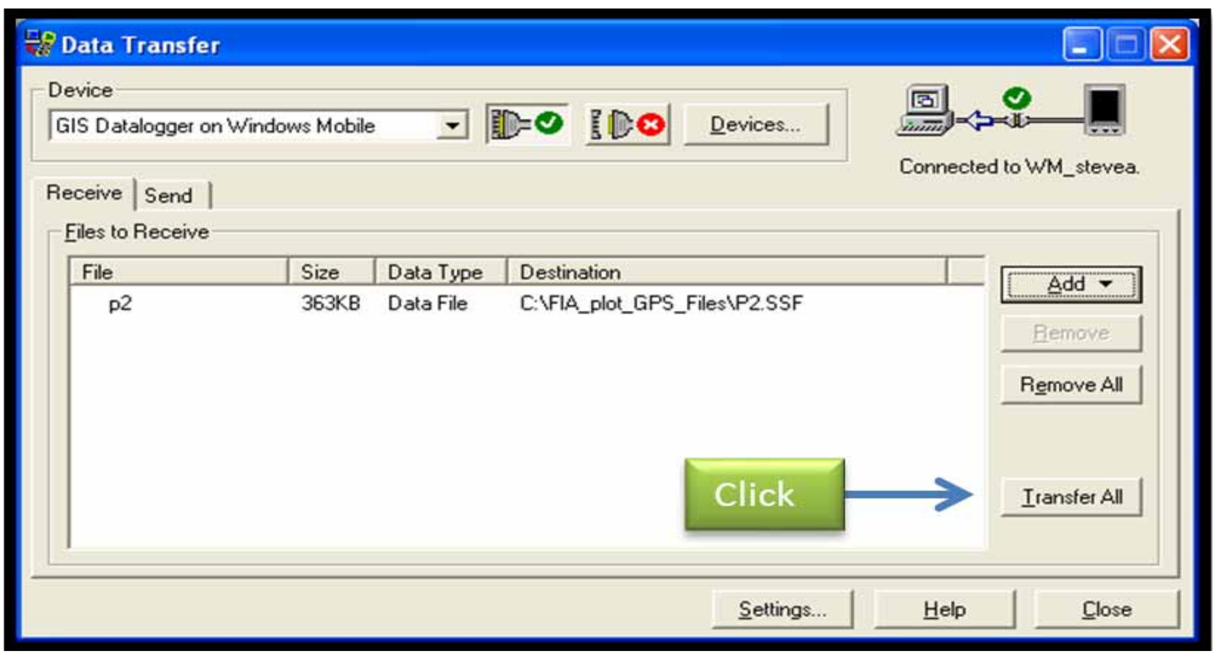
7. Click “Add”, “Data File” (this will add files to the list to be received by the laptop)



8. Browse to the C:\Midas\PlotPackets\PNWRS\GPS, highlight the file (or files) to be transferred (hold laptop "Ctrl" key to select more than 1 file), then click “Open”



9. Click “Transfer All” to transfer the file(s) to the laptop. If there are files in the list that should not be transferred, remove them by selecting them and clicking remove.



10. The Rover File transfer is now complete.

SUBSECTION P.2.5 CHARGING THE TRIMBLE BATTERY

The Trimble battery life is about 10 hours continuous run time. The battery should be charged each night if possible. If not, conserve power by completely shutting down the unit when not in use by holding the green power button down for 3 seconds and then tapping "Shutdown".

If camping for extended periods (1 week), a fully charged battery should allow GPS'ing of 5 full plots (20 subplots at 20 minutes run time per subplot is 6.7 hours, leaving 2 hours of battery life for navigation to plots).

The battery can be charged in the unit or removed from the unit.

1. To remove the battery pack: Pinch the latches together until the latches disengage from the handheld, and then slide the battery out.

2. To install the battery pack: Insert the battery pack into the battery opening and then push the battery firmly into the handheld, ensuring that both battery latches click into place fully.

SECTION P.3 INSTRUCTION OPERATING THE JAVAD TRIUMPH 2 RECEIVERS

SUBSECTION P.3.1 FIELD DATA COLLECTION PROTOCOL WITH TRIUMPH 2 RECEIVER

WARNING! Before using a receiver for the first time, make sure that the Option Authorization File (OAF) is correctly loaded - see Subsection P.3.4 to connect to update the OAF.

For each of the 4 subplots collect **AT LEAST** 15 minutes (900 observations) of data. Please collect more readings if possible - i.e. even if 900 observations have been collected, do not terminate data collection unless it prevents you from proceeding with data collection on the subplot or plot. It is acceptable to lower the receiver and work above the receiver if you have achieved 900 observations.

Make sure the receiver is charged nightly (receiver will not charge via usb port), although the receiver documentation indicates that the receiver will last up to 24 hours on a single charge. This means that by judicious use of energy (turn receiver off between subplots) the power can be eked out to last a number of days.

1. Mount receiver to tripod using screw threads on the base of the receiver. Center tripod on sub-plot center. Fully extend legs, and raise tripod to its greatest height, and level receiver with bubble level over the subplot center.
2. If the tripod is on a slope, orient the receiver so that 2 legs are downhill and 1 leg is uphill.
3. Press and hold power button to turn on/off receiver
4. Wait for the position LED to turn yellow or green before recording data.
5. Begin recording data by pressing the grey record button on the side of the Triumph-2 until the corresponding LED turns green.

6. Record data for at least 15 minutes. To stop recording press the record button until the record light turns from green to yellow to off. Ensure that the record light stops blinking before removing Javad unit from subplot center.

Note: For greater flexibility in file naming and receiver monitoring see Subsection P.3.6 for instructions on using an external device to control the receiver.

SUBSECTION P.3.2 TROUBLESHOOTING DATA COLLECTION IN THE FIELD

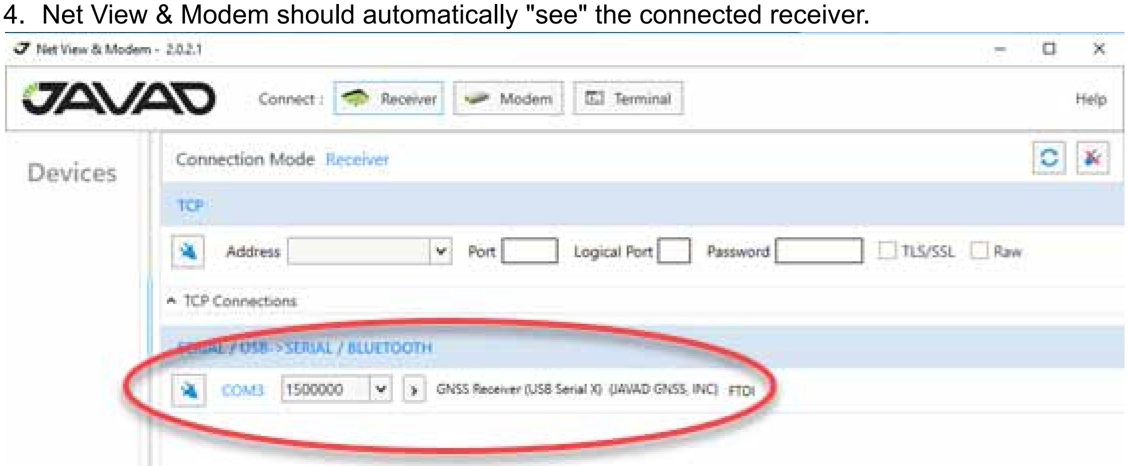
On rare occasions the receiver will not behave as expected (strange blinking patterns, or receiver will terminate data collection early etc.) In the event of a malfunction, there are two trouble shooting steps that can be taken in the field. If neither strategy works, verify that the OAF is loaded correctly.

1. Turn receiver off / on - this works in most cases
2. Clear NVRAM - this will **NOT** delete files from the receiver
   A. Turn the receiver OFF with ON/OFF button.
   B. Press and hold Record button.
   C. Turn the receiver ON by pressing ON/OFF button.
   D. Wait till all LEDs will flashing yellow (except battery LED).
   E. Release Record button

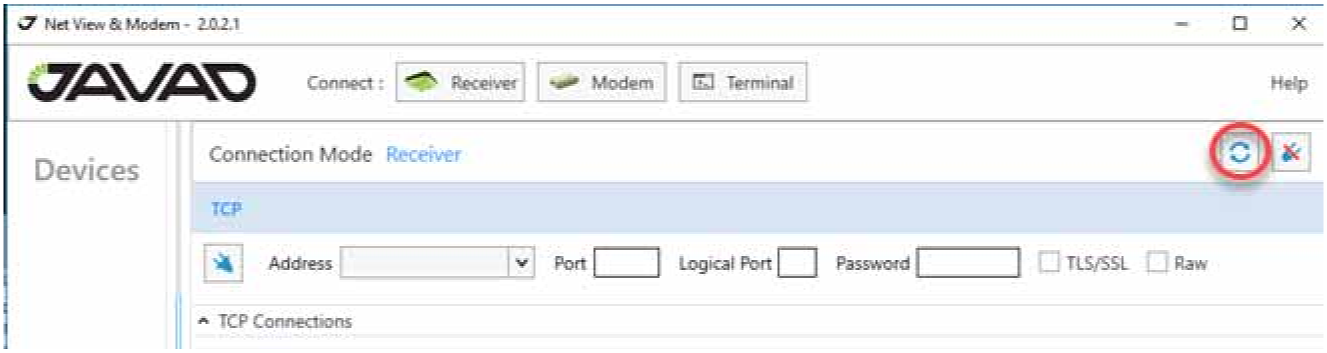
SUBSECTION P.3.3 DOWNLOAD FILES FROM THE TRIUMPH 2 TO A COMPUTER USING USB CABLE

Note: The default filenames of locations are based upon the date (month and day) followed by sequential numbers. Files will need to be renamed once the Javad unit is connected to a computer.

1. **Make sure the receiver is ON**
2. Connect the Triumph-2 directly to a computer using a USB cable.
3. Open **NetView & Modem** on the computer
4. Net View & Modem should automatically "see" the connected receiver.

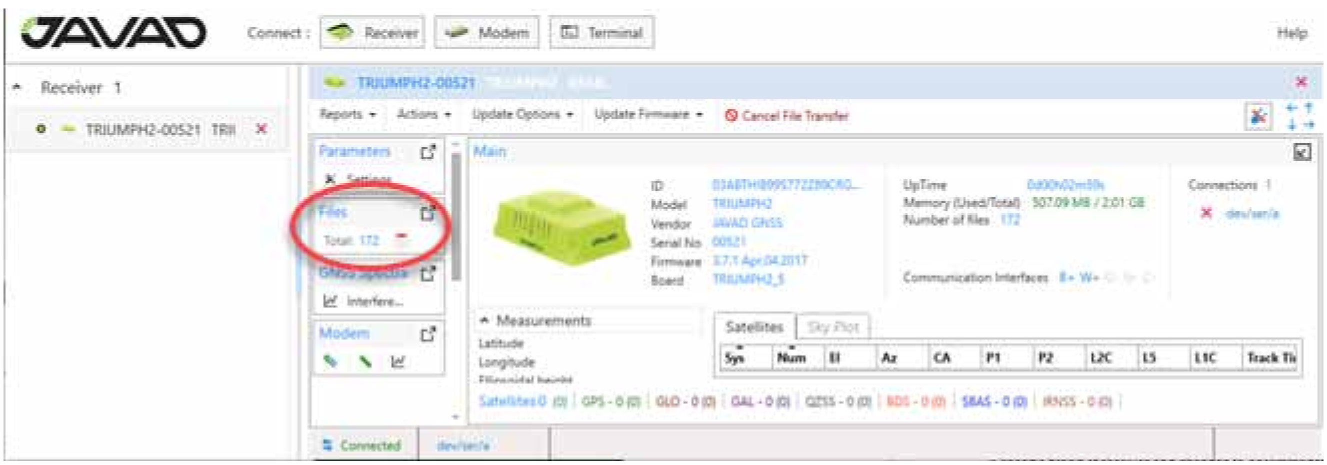


5. If the receiver is not visible hit the refresh button

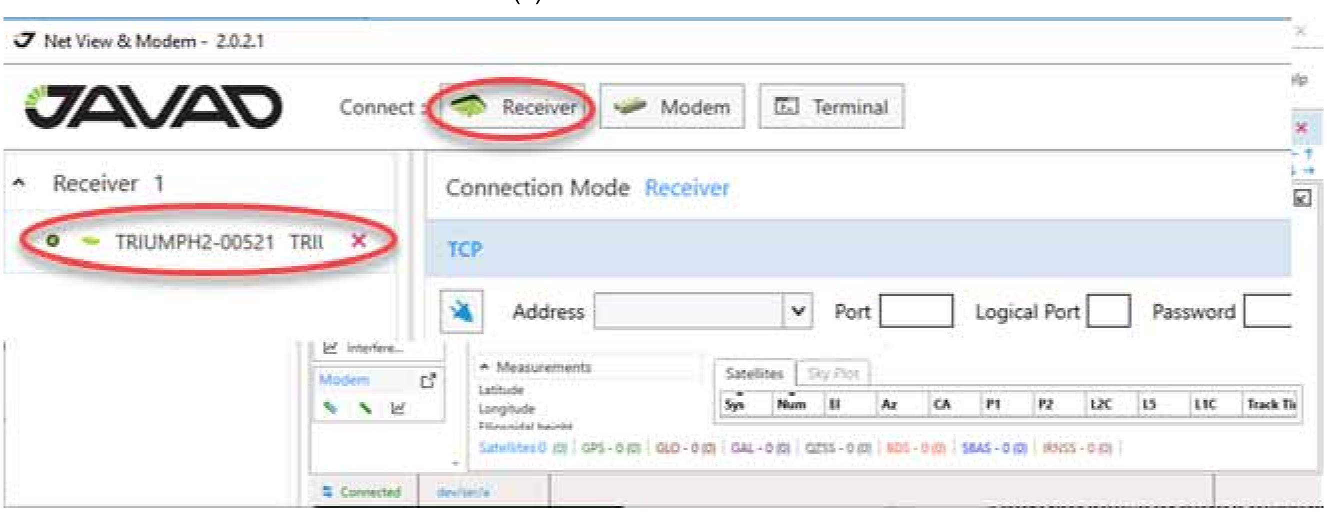


6. Once the receiver is visible, hit the "connect" button

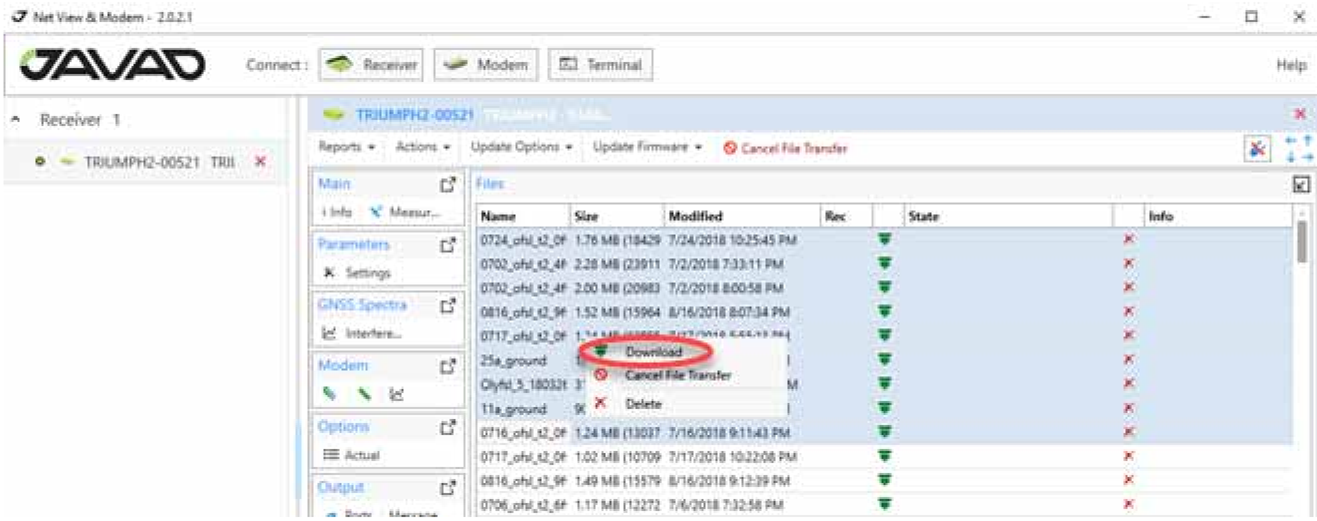
7. Once the receiver is connected, the screen should change to something like this. Select "Files" to see available files.



If you do not see the screen above, click on the name of the receiver and it should take you to the correct screen. To return to the connection(s) hit the receiver button.



8. In the "Files" screen highlight the files that you wish to download (Shift-click or Ctrl-click). Then right click and choose "Download".



9. When files are downloaded rename the files using this format:

For production plots: st-cty-plot%-sp# (e.g. ca-029-05247-sp1 where st is the 2 character statecode, cty is the 3 digit county code (including any leading zeros), plot% is the 5 digit plot number (including any leading zeros), sp# is "sp" followed by the 1 digit subplot number 1-4).

For cold and blind plots: Add a C or a B to the end of the file name (e.g. ca-029-05247-sp1C, ca-029-05427-sp1B). This will prevent the cold or blind rover files from overwriting the production rover file when loaded to the server.

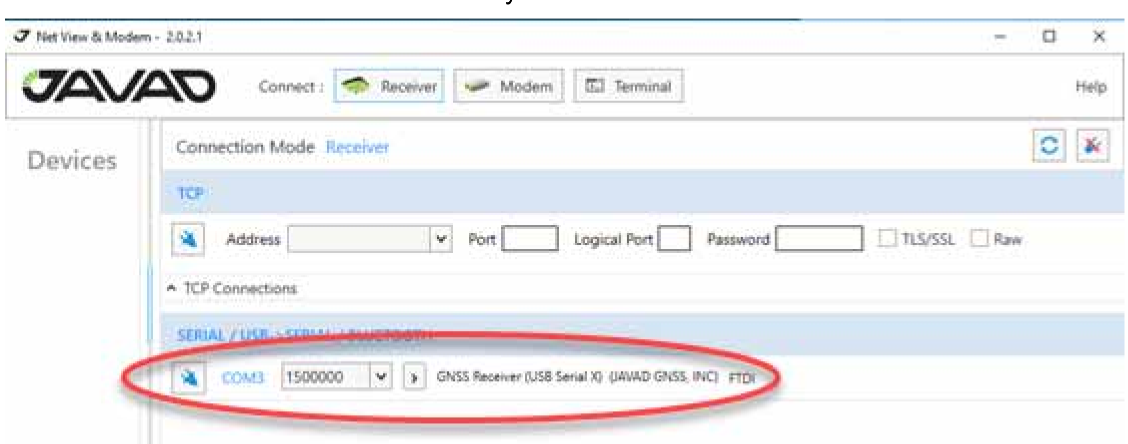
SUBSECTION P.3.4 VERIFY THE OAF IS LOADED CORRECTLY

This step only needs to happen once for each receiver, but please verify that the OAF is loaded.

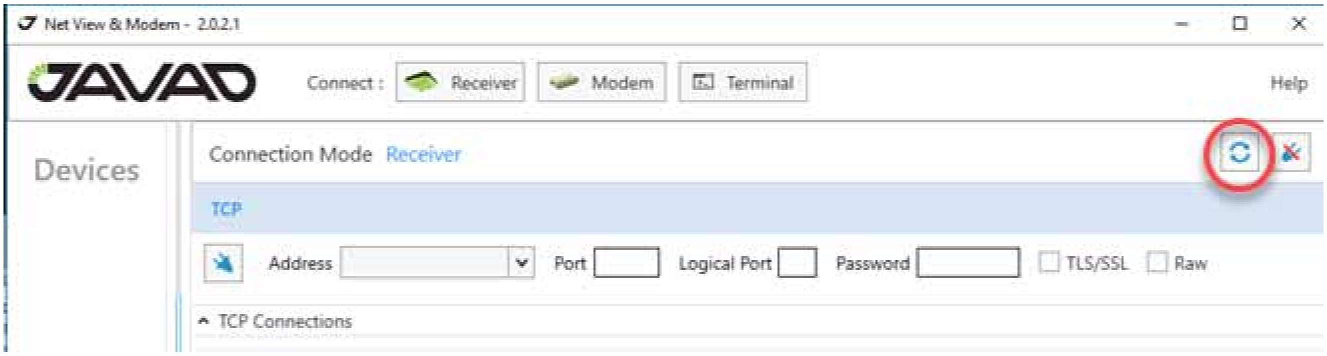
The OAF is the license that enables the receiver to collect data. The **PRIMARY** mistake with Javad receivers is to not load the OAF – resulting in a failed HPGPS data collection…

This step will require you to have an internet connection, or to have the OAF file that was sent to you by Javad.

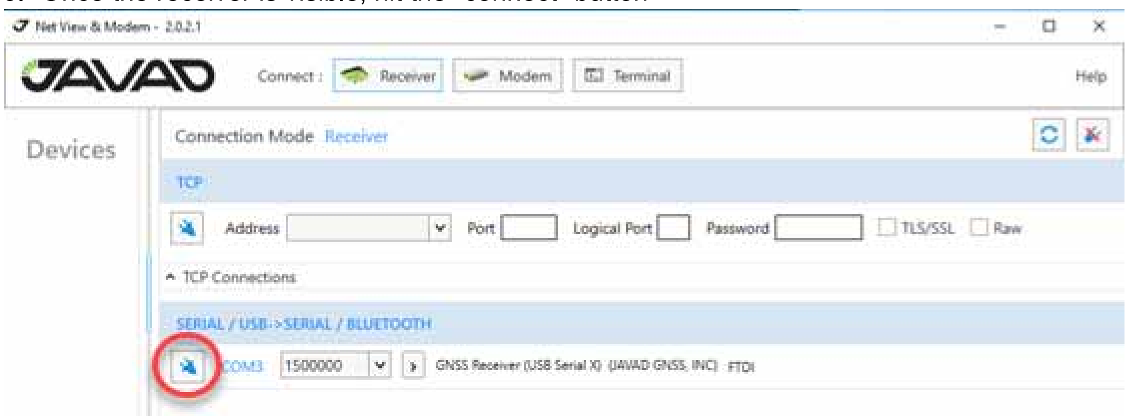
1. **Make sure the receiver is ON**
2. Connect the Triumph-2 directly to a computer using a USB cable.
3. Open **NetView & Modem** on the computer
4. Net View & Modem should automatically “see” the connected receiver.



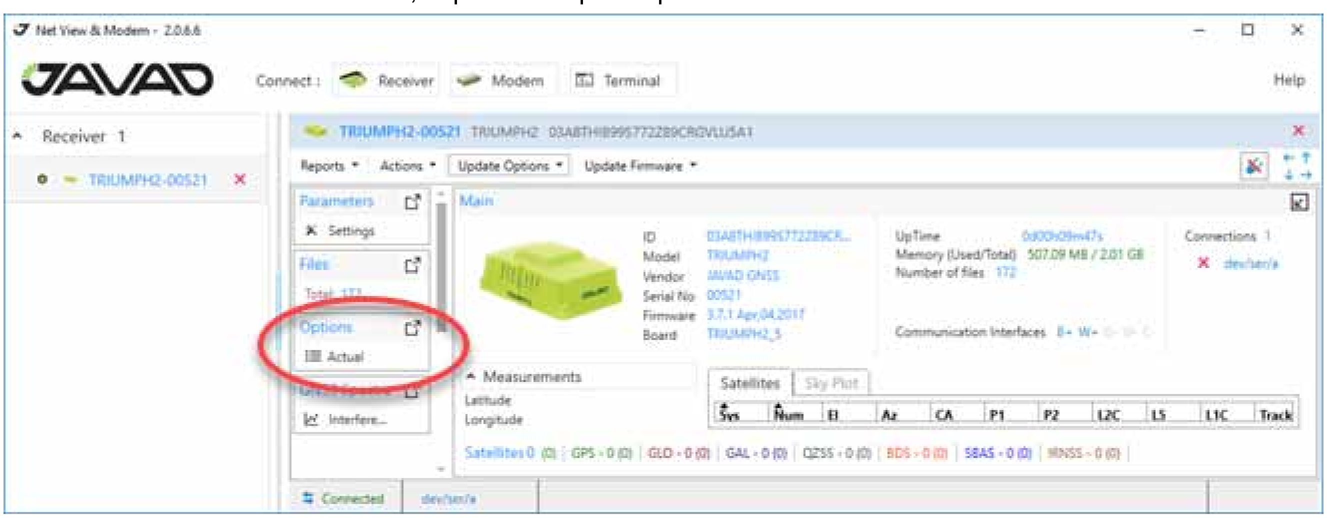
5. If the receiver is not visible hit the refresh button



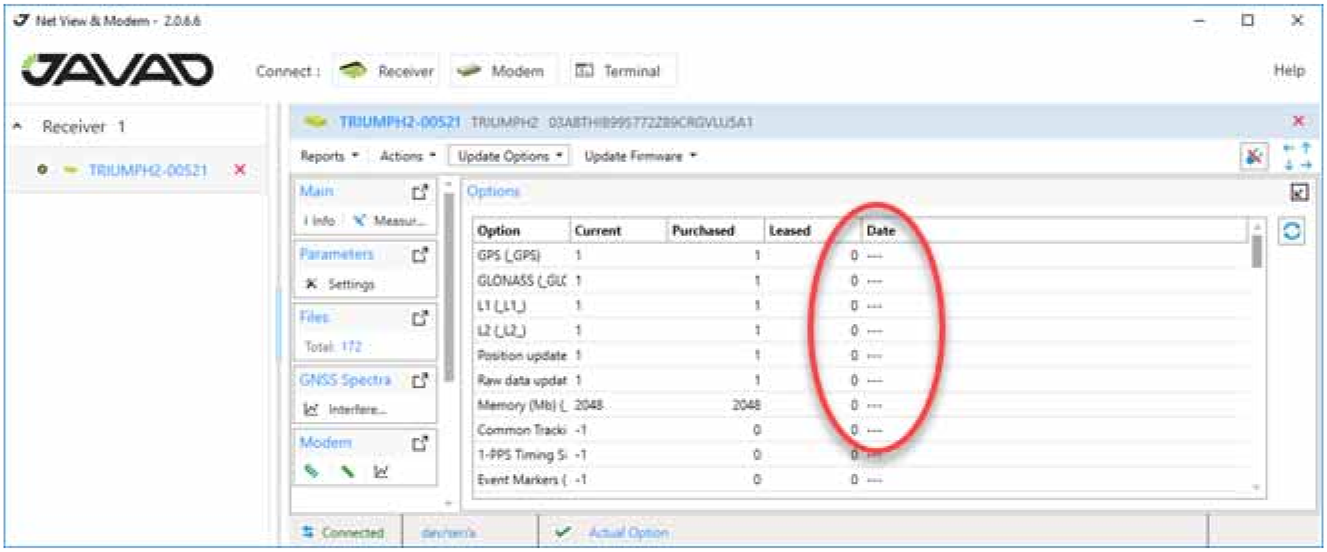
6. Once the receiver is visible, hit the "connect" button



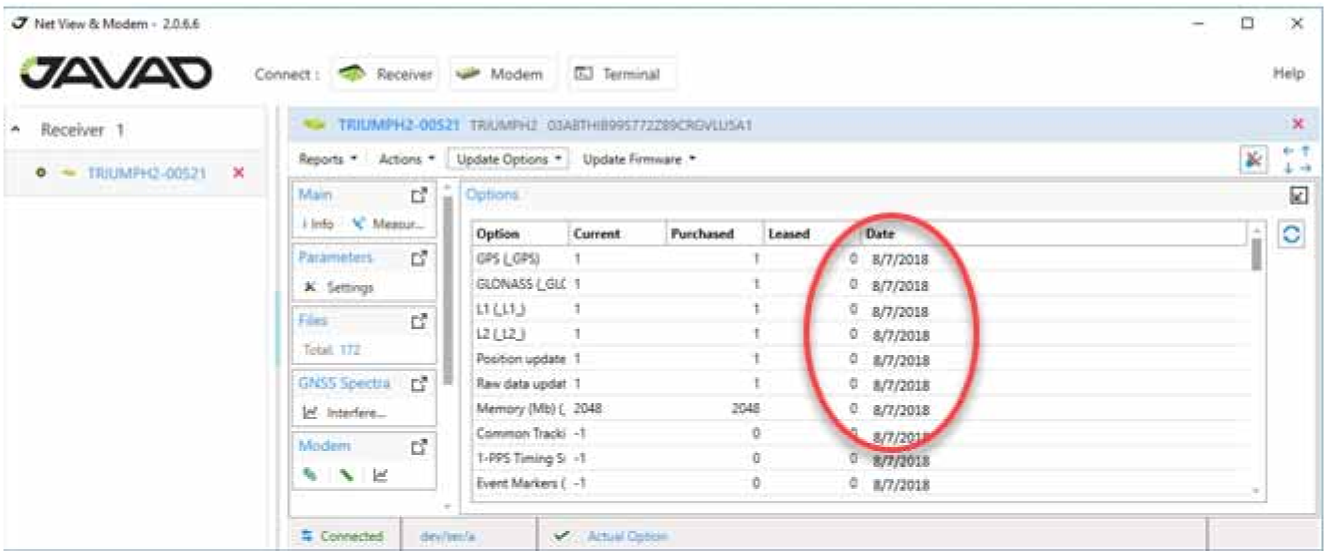
7. On the receiver screen, expand the options panel



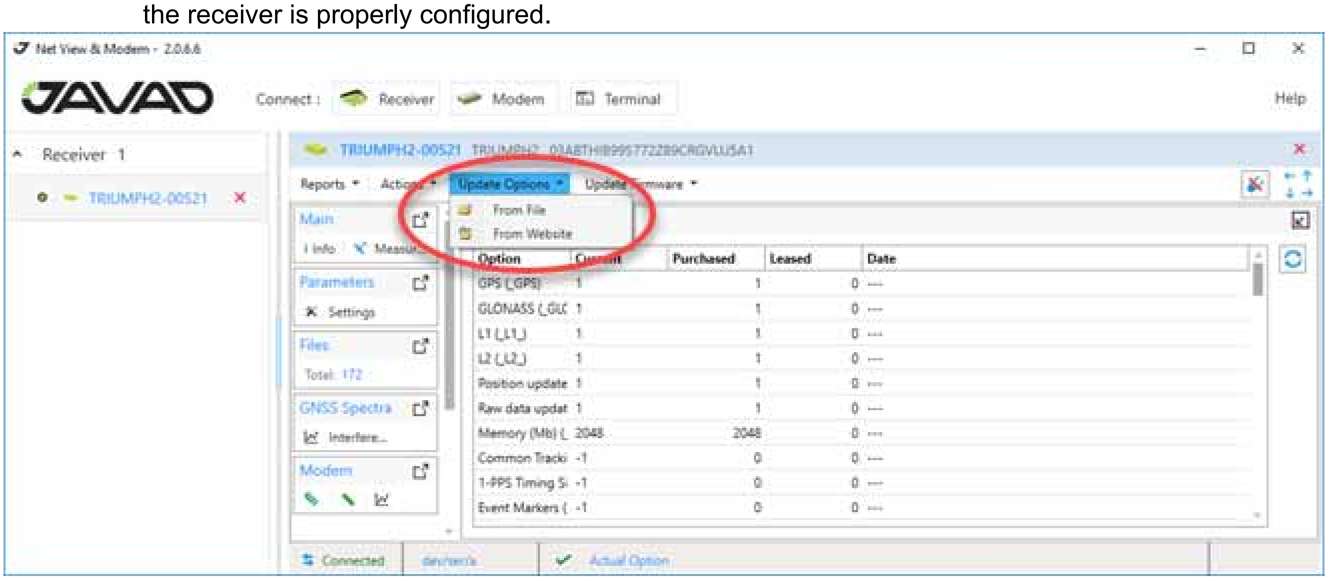
8. Verify that all of the options have slashes --- underneath "date"



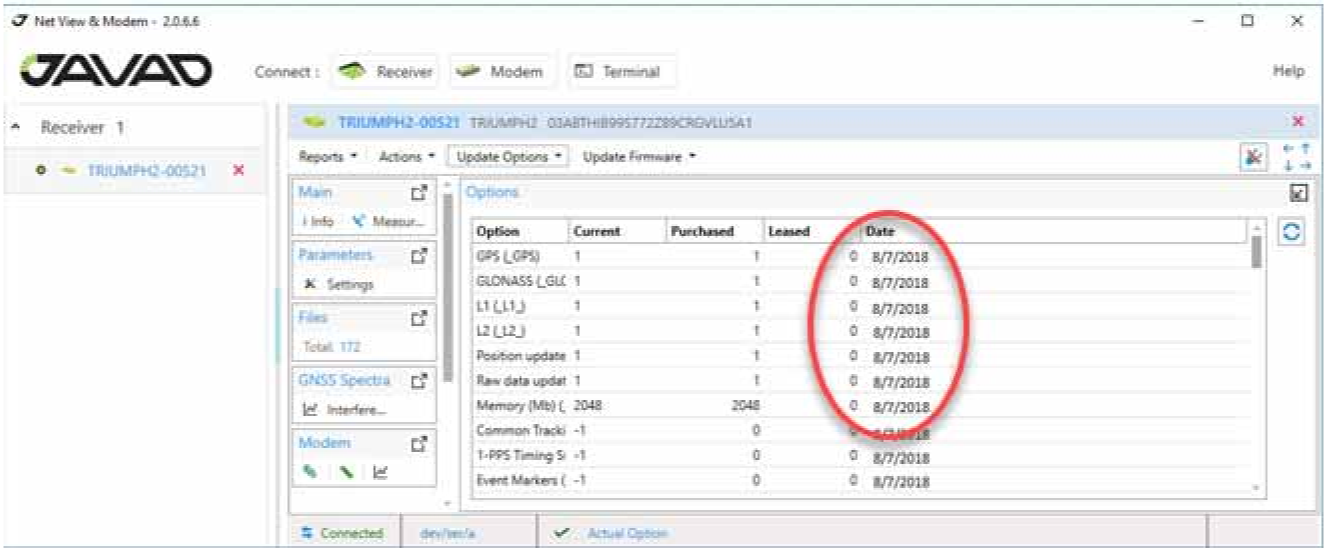
9. If the options have expiration dates, you will need to update your OAF



10. To update the OAF, select "Update Options" and select "From Website". Make sure that Javad has received payment for the receivers. Javad will send the receivers BEFORE receiving payment… If you have the OAF file (typically sent by email after payment) you can also update "From File". After updating options, hit "Refresh" on the right side. In the image below there are no expiration dates, indicating that the receiver is properly configured.



11. If there are still dates next to options, then it is likely that Javad does not believe that the receiver has been paid for. Contact your procurement officer to verify that payment has been completed.



SUBSECTION P.3.5 ADDITIONAL DETAILS ABOUT INTERFACING WITH RECEIVER

To **turn ON** the receiver press the power button. To turn OFF the receiver, press and hold the power button until LEDs are off and then release the button.

The **MinPad** is the receiver's minimum interface used to display and control data input and output.

Function	Symbol	Green	Yellow	Red	OFF
BATTERY [1]		Full	Half	Almost empty	OFF/No power
WLAN		Connected	Initialization	Error	Not Active
SATELLITES [2]		8 or more	5 to 7	Less than 5	No Satellite
POSITION		Fixed/Diff/ OK (Base)	Float/No-Diff	No Position	Receiver OFF
RECORDING [3]		Recording	Less than 10 min memory left	Memory Full	Not Active

1.Blinking every 1 sec according to the battery means receiver is ON without external power. LED solid according to the battery means external power is connected.

2. Effective number of satellites are total number of satellites tracked minus the number of non-GPS systems tracked. For example if 8 GPS and 5 GLONASS are tracked the effective number of satellites is 12.

3. RECORDING LED blinks on each recording.

Function	Symbol	Blue	Yellow	Red	OFF
BLUETOOTH		Connected	Searching	No connection	Not Active

The **Record button** starts/stops data recording.

Power port is used to connect the receiver to an external power source and to charge the batteries.
Input voltage: +10...16 VDC.

USB port is used for high-speed data transfer and communication between the receiver and an external device.

How to clear NVRAM

1. Turn the receiver OFF with ON/OFF button.
2. Press and hold Record button.
3. Turn the receiver ON by pressing ON/OFF button.
4. Wait till all LEDs will flashing yellow (except battery LED).
5. Release Record button.

SUBSECTION P.3.6 CONTROL THE JAVAD RECEIVER WITH AN EXTERNAL DEVICE

See the Triumph-2 Quick Start guide for details on how to download NetBrowser for iOS and Android and to connect to your external device. iOS connects to the Triumph 2 using Wi-Fi and Android device connect with Bluetooth.

1. Open the NetBrowser app on the device.
2. Select "files" from the menu.

3. Name the subplot using the appropriate FIA naming convention

For production plots: st-cty-plot%-sp# (e.g. ca-029-05247-sp1 where st is the 2 character statecode, cty is the 3 digit county code (including any leading zeros), plot% is the 5 digit plot number (including any leading zeros), sp# is "sp" followed by the 1 digit subplot number 1-4).

For cold and blind plots: Add a C or a B to the end of the file name (e.g. ca-029-05247-sp1C, ca-029-05427-sp1B). This will prevent the cold or blind rover files from overwriting the production rover file when loaded to the server.

4. Enter the antenna height in meters
5. Enter "Vertical" for the height type.
6. Leave the default values for the other fields. Mode should always be "Static".
7. Tap "Start Recording" to begin recording data.
8. You need to record data for at least 15 minutes. A longer recording time is encouraged.
9. To stop recording, tap "Stop" beside the filename. You may have to scroll down to see the list of files and access the "Stop" button.

SECTION P.4 GARMIN OREGON GPS UNIT

SUBSECTION P.4.1 BUTTON COMMANDS

There is only one button on the Oregon; it is the On/Off button on the upper right side of the unit. Press this button once to turn the unit on. Pressing this button again brings up a screen which allows you to adjust screen brightness and to lock the screen. Hold the button down for 2 seconds to turn the unit off.

The Oregon is operated with touch-screen buttons (Figure P.1). The left/right arrows at the bottom of the screen allow you to access all buttons within each menu. Touching the Battery/Satellite icon on the bottom of the main menu screen will show the number of satellites acquired and position. The “X” or the bent left pointing arrow icon on the bottom of each screen will back out of each screen into the main menu.

Figure P.1: Oregon touch screens

SUBSECTION P.4.2 NAVIGATION SCREENS

Turn the unit on and press Setup/ Main Menu. Choose the Profile Change icon and then choose the Recreational profile. Choose each navigation screen that will not be used, and then touch the garbage can icon. The order how each icon appears on the Main Menu can be altered by touching the icon you want first on the list when the GPS is turned on, then scroll over to the left using the left arrow and touch the first icon. For example, if you would like the Average Waypoint icon to be the first one, touch that then scroll over and touch the Map icon. The Average Waypoint icon will now be first, and the Map icon will be second. Repeat this process for the Automotive profile.

SUBSECTION P.4.3 SETUP UNITS

The parameters to be set up before collecting satellite readings are listed below. Once these parameters are set up for the first time they will not need to be reset. Periodically (at least weekly), settings should be checked to verify they have not been inadvertently changed.

Touch the Profile Change icon
Touch the Recreational icon
Press the Setup icon, then Position Format
Position Format: UTM UPS
Map Datum: NAD83
Map Speroid: GR S80
Go back to the setup screen using the bent left arrow and touch the Units icon.
Distance/Speed: Statute
Elevation (Ver.Speed): Feet (feet/minute)
Repeat this process for the Automotive profile

SUBSECTION P.4.4 OPERATING THE GPS ON PLOT

1. Turn on the GPS.
2. Check to see if the unit is receiving satellite readings by pressing the Battery/Satellite icon. The satellite status screen shows “acquiring satellites” until it has enough satellites to calculate your position. When the unit has acquired at least four satellites it will display position coordinates in the upper left of the screen and the GPS accuracy in the upper right of the screen. Verify that the GPS unit is in the Recreational profile by choosing Change Profile from the main menu, then choose Recreational.
3. When the GPS accuracy is below 70 feet, make a note of the GPS accuracy, go back to the main menu and touch the Waypoint Averaging icon. A screen with sample confidence, averaged location coordinates, and averaging time (Figure P.2) will appear. Leave the GPS unit in one place until the average function is completed. It is possible to reach 3 minutes of averaging time before the sample confidence has reached 100 percent. For more accurate coordinates, save the waypoint once the sample confidence has reached 100 percent. Note the averaging time before saving the waypoint. Save the averaged coordinates by touching the Save icon; a waypoint will be saved and named automatically. To edit the name of the waypoint go to the main menu and touch Waypoint Manager, the saved

waypoint, and Change Name. The “<“ icon to the right of the name erases the name. Type letters or numbers to name the waypoint. Touch the green check icon to save the new name..

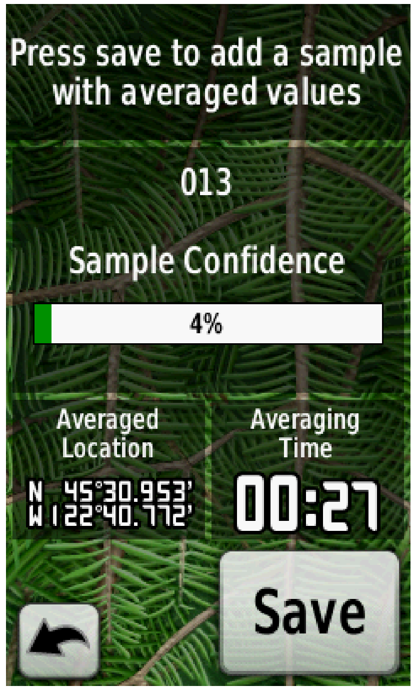


Figure P.2: Sample confidence

4. To view the averaged waypoint coordinates from the main menu, touch Waypoint Manager and the name of the waypoint. Touch the down arrow and then touch View Map. Touch the name of the waypoint in the icon at the top of the map screen. The elevation and waypoint coordinates will be displayed. The GPS accuracy will not be displayed. You will need to view the GPS accuracy either before or after the waypoint is averaged.

SUBSECTION P.4.5 CREATING A WAYPOINT (WHEN COORDINATES ARE PROVIDED)

Turn on the GPS and touch the Mark Waypoint icon. Touch the Save and Edit icon. Touch the Change Name icon. Touch the < icon to the right of the waypoint name to delete the name automatically given to the waypoint. Type in the name you want to give the waypoint using letters, numbers, and/or symbols. Numbers and symbols can be accessed by touching the right arrow at the bottom of the screen. When you are done, press the green check icon at the bottom of the screen to save the new name. Touch the Change Location icon. Edit the coordinates by touching the right/left arrows to highlight the values you would like to change. Touch the number buttons to enter new values. When you are done entering the coordinates, touch the green check icon at the bottom of the screen. Touch the down arrow until you see the View Map icon. Touch the View Map icon and the waypoint will be displayed on the map.

SUBSECTION P.4.6 MARKING (STORING) YOUR CURRENT LOCATION

This feature is used to mark (store) a current location as a waypoint in the GPS unit’s internal memory.

Once the GPS accuracy is less than 70 feet, touch the Mark Waypoint icon. Touch the Save and Edit icon. Touch the Change Name icon. Touch the “<“ icon to the right of the waypoint name to delete the name automatically given to the waypoint. Type a name for the waypoint using letters, numbers, and/or symbols. Numbers and symbols can be accessed by touching the right arrow at the bottom of the screen. To save the new name, press the green check icon at the bottom of the screen. Press the “X” icon at the bottom of the screen to access the main menu.

SUBSECTION P.4.7 NAVIGATING TO A WAYPOINT

To begin navigation, a waypoint must be stored in the GPS unit (Subsection P.4.5). On the initial screen, touch the Profile Change icon. Touch Recreational. If your GPS unit is in Automotive profile mode the GPS will give you directions along roads and will not show your “tracks”. Make sure the GPS is in Recreational profile to show the most direct route to your waypoint, topographic lines, and to show the route you took to the waypoint. After the unit has locked onto four satellites, touch the “Where To?” icon. Touch the Waypoints icon. Touch Waypoints. You can search for a waypoint in this screen by touching the ABC icon at the bottom of the screen and entering the name of the waypoint. Touch the name of the waypoint you want. Touch the green GO button at the bottom of the screen. A map will appear on screen with your current location. Distance to destination and bearing will show at the top of the screen.

SUBSECTION P.4.8 BATTERIES

The Garmin Oregon GPS unit uses two AA batteries, which usually last for eight hours of use. Replace the batteries when the low battery screen is displayed or the power indicator located at the bottom of the main menu screen is low. The GPS may have trouble locating satellites if the battery is low.

SECTION P.5 COLLECTING GPS INFORMATION

SUBSECTION P.5.1 GPS READINGS

GPS information is recorded in the PDR (see Section 4.4, GPS Coordinates). For Garmin Oregon 400t GPS receivers, record GPS UNIT TYPE code 2.

APPENDIX Q LASER INSTRUCTIONS

SECTION Q.1 LASER 200 INSTRUCTIONS

SUBSECTION Q.1.1 OVERVIEW

Accurate heights are necessary in order to determine tree volume and for other uses. The laser can be used to get fast and accurate tree heights. It can also be used to measure distances and percent slope. This instrument is more fragile than the GPS units. Some precautions must be taken with the lasers to keep them working properly. These are:

Never look at the sun through the scope. Looking directly at the sun can permanently damage your eyes.

Never point the laser directly at the sun. Exposing the lens system to direct sunlight, even for a brief period, may permanently damage the laser transmitter.

Do not expose the laser to extreme temperatures. It is rated for a temperature range of -22 to +140 degrees fahrenheit. Don’t leave the instrument in the vehicle during the heat of the day.

Do not use batteries with “voltage check” features built on the batteries. The battery case of the laser is too narrow for these batteries, and they could get stuck in the instrument.

Do not drop the laser. Immediately return it to its case when you get back to the vehicle. There is usually more danger of damaging the instrument in the vehicle than out in the woods.

SUBSECTION Q.1.2 BASIC OPERATION

All directions for using the laser buttons are given assuming you are holding the instrument with the LCD display screen facing you and the 2 round lenses are facing the object you want to measure. The buttons will be referred to as:

L1 - the left button closest to you
L2 - the left button in the middle
L3 - the left button furthest away from you
R1 - the right button closest to you
R2 - the right button in the middle
R3 - the right button furthest away from you

- Turn the laser on by pushing L1 or R1
- Turn it off by pushing L2 and L3 at the same time. The laser may turn itself off after a period of inactivity. Once the instrument is on, push the R1 button to make the red dot appear in the sighting scope. If there is no red sighting dot, repeatedly push the L2 button until the red dot appears and is the correct brightness.
- To light up the display screen, press L3. Press L3 again to turn off the light.

SUBSECTION Q.1.3 SETTINGS

Make sure the settings are correct before using the laser. To set the correct measurement units, go into the main menu and:

Step 1. Press R2 or R3 to scroll through the menu until SYS is displayed in the upper right hand corner of the screen.

Step 2. Press R1. ON or OFF will show in the center of the screen. FILTER will flash at the bottom.

Step 3. Press R2 until OFFSET is flashing. The number displayed should be 0000.00. This means that the starting measuring point is the center of the instrument.

Step 4. Press R2 until PIVOT is flashing. The number displayed should be 0000.59. When this number is set at 0.00, the laser is set to calculate heights using a tripod attached to the center of the instrument. The pivot point is the center of the laser. We use the pivot value at 0.59 because this sets the pivot point at the rear of the instrument, and this allows you to shoot a height while using your head as the pivot point. To change this number, press L1 until the number you want to change is flashing. Press L2 or L3 until the correct number is showing. When the number is set at 0000.59, press R1.

Step 5. Press R2 until UNITS is flashing. Select F (feet) using the R1 button.

Step 6. Press R2 again and D (degrees) should be flashing. If not, press R1 to toggle on D.

Step 7. Press R2 again and "%" should be flashing. It should say ON. If not, press R1.

Step 8. Press R2 until M and V are flashing. The numeric display will show the current interval settings, like "P2 d15", with P indicating the power-off interval in minutes and d indicating the scope-dot interval in seconds. Press R1 until the numeric display shows the intervals you want (P2 d15, P5 d15, P5 d60, or All On). With All On setting both intervals are full on (the instrument will not power down, and the scope dot will never turn off). Care should be taken in this mode, as it is highly power consumptive.

Step 9. Press R2 until UPDATE flashes. Press R1 to toggle the beeper on or off. When you turn it off, the ☼ flashes three times and reads "OFF." When you turn it on, the instrument beeps three times and reads "On."

Step 10.Press R3 twice to accept the new settings and back out to the main display.

SUBSECTION Q.1.4 FILTER AND REFLECTORS

When you are working in areas of dense brush, you need to make sure the laser is giving you the distance to the correct target. The best way to do this is to use a reflector as a target and use the filter option on the laser. The laser will only lock onto the highly reflective targets and ignore the less reflective brush. To use the filter option:

Step 1. Place a reflector (or have someone hold it) on the tree where it can be seen from the required distance. The laser will not work in the filter mode without a reflector as a target.

Step 2. Go to the main menu on the laser and push R2 or R3 until SYS is displayed on the screen.

Step 3. Press R1 to select the SYS option. The FILTER option will blink, and it will say the FILTER is OFF or ON.

Step 4. Push R1 to toggle FILTER between ON and OFF.

Step 5. Press R3 to save the desired setting and to back out into the main display. When the FILTER is on, FILTER will appear at the bottom of the screen when the laser is measuring distances.

SUBSECTION Q.1.5 DISTANCE AND PERCENT SLOPE

Horizontal distance (HD): Turn the laser on. The top-middle of the LCD screen will say HD. Point the red sighting dot at the target. Press R1 and hold it down until the laser locks on the target, then release. You can tell when the instrument locks onto its target by sound. It buzzes while it is searching for the target, then beeps when it locks on to a target or there is an error. If you get an error message, simply aim again and press R1.

Slope distance (SD) and Vertical distance (VD): Push R2 or R3 until the correct display is shown. Then aim and press R1 until the laser locks on target. Or, measure a horizontal distance, then push R2 until the correct display is shown.

Percent slope: Press R2 or R3 until INC is displayed. Then aim and press R1.

SUBSECTION Q.1.6 TREE HEIGHTS

The best way to measure a tree height is to make sure you have a clear shot at the leader or a clear shot of the tree trunk. Make sure you are getting a distance to the tree trunk, and not some branches in front of it. If you can't get a clear shot at the leader or the tree trunk, use a reflector (Subsection Q.1.4). Once you are in position with your target in sight, go to the main menu:

Step 1. Push R2 or R3 until HT is displayed in the upper left of the screen.

Step 2. Push R1 once, aim at the target, then push R1 until the laser locks on target. This will measure the horizontal distance.

Step 3. The down arrow will flash. Aim at the base of the tree and push R1 to get the percent slope.

Step 4. The up arrow will flash. Aim at the top of the tree and push R1 again to get another percent slope.

Step 5. Press R1 once more and the laser will display the height. Make sure this height is reasonable before recording it in the PDR.

SUBSECTION Q.1.7 GATES

The gate option can extend the laser's minimum range or restrict its maximum range. It is most often used to help you make sure you are hitting the right target when objects near you or just beyond your target might give you false readings. You don't have to set both gates. You will probably only need to set the short gate because of brush or fog between you and your target. You can set a gate by shooting a target or by entering distances into the instrument. To set a short gate by laser, go to the main menu and:

Step 1. Press R2 or R3 until GATE is shown on the display.

Step 2. Push R1 to select the gate option.

Step 3. Press R1 to toggle the gate between ON and OFF.

Step 4. Push R2. The S indicator will flash.

Step 5. Aim at a target that is at the distance you want to set as the short gate and press R1.

Now you can either set a long gate, or press R3 to go back to save the short gate and return to the main menu. The S will be displayed when you are measuring distances to show the short gate is on. To set a long gate:

Step 6. Push R2. The L indicator will flash.

Step 7. Aim at an appropriate target and press R1.

Step 8. Press R3 to save the gate and go back to the main display. The L will be displayed when measuring distances.

The gates are reset to OFF when the laser is turned off, but gate values are saved in memory. This means that if you have saved a gate and turn off the instrument, when you turn it back on the gate will be set to OFF. If you go back into the gate option and turn the gate ON, it will remember the last distances you shot for the long and short gates.

To clear out a gate value: Display the gate values by following the instructions in this section. When the desired gate value is displayed, press and hold down R3 until the number is deleted.

SUBSECTION Q.1.8 CUMULATIVE DISTANCES

A cumulative distance measurement allows you to move from one target point to the next, stopping at each one to measure the distance to the next target point. The laser accumulates the measured distances in both slope and horizontal distances (SD and HD) to give you a running total.

To take a cumulative distance, go to the main menu and:

Step 1. Press R2 or R3 until MULTI is displayed on the screen.

Step 2. Press R1 to enter the MULTI option. DIFF will be displayed.

Step 3. Press R2 once. CUM will be displayed.

Step 4. Press R1. Either SEL or a number will be displayed. If SEL is displayed, HD will flash on and off. Press R1 to toggle between HD and SD. Press R2 when the correct indicator is flashing. If a number is displayed, that means there is already a cumulative distance saved on this instrument. You can either clear out this distance by holding down R3 until 0.00 appears, or continue to add to the distance by going to step 5.

Step 5. Aim at the target and press R1 to fire the laser.

Step 6. If you are not satisfied with the measurement, repeat step 5 to retake the measurement. If you are satisfied with the measurement, and wish to add it to your total, press R2. The new total will be displayed.

Step 7. Repeat steps 5 and 6 to add more measurements to the total.

You can choose whether you want horizontal or slope distances at any time. If a distance has been measured, you can change from slope or horizontal distance by pressing R3 twice. SEL will be displayed. Push R1 to toggle between SD and HD. Press R2 twice to get back to the total distance. Go to step 5 to add more distances.

The cumulative measurement total is saved in memory even if the instrument is turned off. Turn the instrument on and scroll back to the MULTI-CUM option and resume the procedure with step 5. To clear out the current total and begin another series of measurements, hold down R3 while the cumulative distance is showing until the number is deleted.

APPENDIX R COMPLETING A PLOT

The following instructions describe the requirements for successfully completing a plot. All files are now in electronic format and submitted via an Electronic Plot Folder. It is not a requirement to print out hard copies of these files. These instructions detail how Prefield files are transferred to field staff computers and then loaded upon completion of field data collection. A plot is considered complete when all required files pass inspection by the QA Staff or Inspector.

Physical plot jackets are still distributed to PNW field staff. They include historical documentation from previous visits, and it is the crews' decision if they want to carry it in the field. The information is for reference and can aid in locating plots as well as determining how to code data. Pertinent historical documents are also provided in electronic format and are available for download prior to going in the field.

SECTION R.1 PREFIELD INSTRUCTIONS

There are several Prefield files available for download prior to going to the field. They include: current blank plot card, historical plot card scans, printout of the previous inventory data, digital imagery, and local topo map. Contract crews may have additional files, and these can be found in the BPA Call of the current contract.

1. Download the following Prefield files from the location specified by your QA, COR, or Contract Manager:
   a. Blank, fillable plot card (docx)
   b. Image file for markup (pdf or jpg)
   c. Previous plot cards (pdf)
   d. Data from previous annual visit(s) downloaded from NIMS (pdf)
   e. Data from previous periodic visit(s), if applicable (pdf)
   f. Topographic map (pdf)
   g. 1:24000 reference image (pdf)
   h. Insect and disease history map (pdf)
   i. Fire history map (pdf)
2. Save them locally on laptops in C:\Midas\PlotPackets\PNWRS\Prefield\<State>\2020\<PlotNumber>
3. Printout or transfer any necessary files for the field to an encrypted rugged field tablet or Smart Device.
4. Get plot HIST file from the MIDAS website and transfer to PDR (See MIDAS Instructions):

   https://apps.fs.usda.gov/fia/midas-v2/Documentation/MIDAS_Web(version2)_UsersGuide.pdf

SECTION R.2 MIDAS VALIDATIONS

Upon completion of plot field work, run MIDAS edits. These validations are logic checks making sure plot data is coded correctly and identifies when something is in error or needs further examination. It is advisable to do this while in the field before leaving plot. MIDAS will produce a check list containing errors, critical warnings and warnings. These are part of the plot data file and must be addressed appropriately. All critical warnings and warnings will have a check box next to the message. These boxes should be checked after addressing the issue.

1. Errors - these must be corrected before a plot will load.
2. Critical Warnings - these should be examined and anything not correctable must be explained. To input an explanation, select the check box next to the critical warning. This opens a dialog box. Type in a detailed explanation addressing the critical warning message.
3. Warnings - these should be examined, and the box must be checked after reviewing the message. There is an option to make an explanation, but this is not a requirement unless there is useful information explaining the warning message.

SECTION R.3 ELECTRONIC PLOT FOLDERS

The following components are required for plot file submission as part of an Electronic Plot Folder: plot data file, current plot card, digital image, landowner report or landowner contact form, and survey grade GPS files. Exact file requirements vary on PLOT STATUS; instructions for each piece, file names and folder locations are described within each Section below. A summary of file names and folder locations is also provided in Section R.11.

The plot data file is generated from the HIST file when opening a plot to collect data. After collecting data and running MIDAS edits in the field, download plot files from the PDR to a laptop (see MIDAS Instructions). The file will be transferred to the correct location automatically and is located in C:\Midas\MIDASData\Work\pnwrs.

For reference, the MIDAS plot file name is:

State.County.PlotNumber.Cycle.Subcycle.Phase.FieldGuideVersion.STD

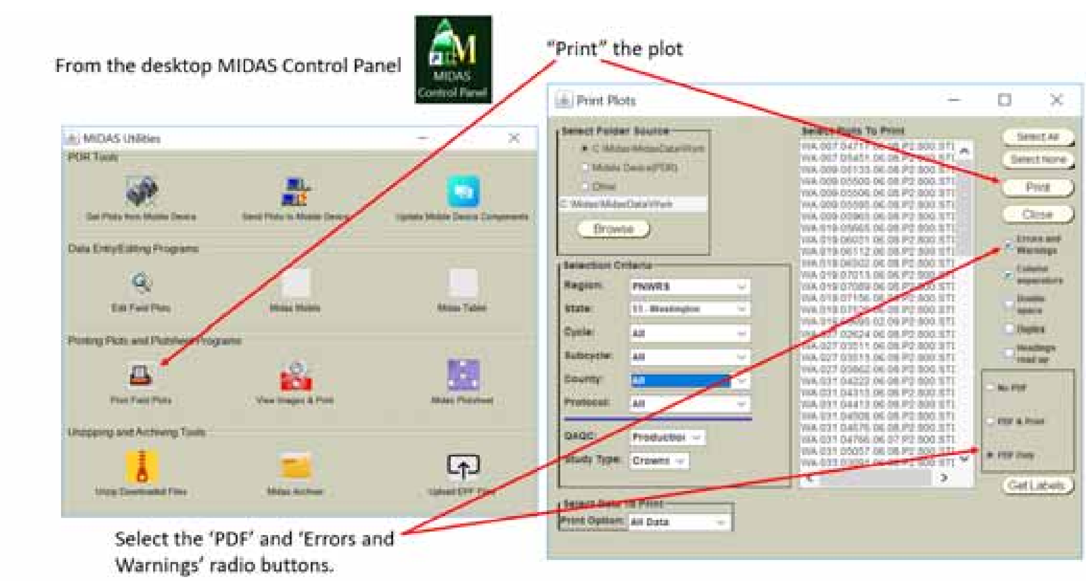
and will be noted as <MIDASfilename> for the remainder of this appendix.

SECTION R.4 PLOT PRINTOUT

The plot data must be 'printed' to PDF format to facilitate plot editing and EPF loading. A hard copy is optional and no longer required for submission. This file includes the plot data, MIDAS critical warnings, warnings and explanations, Boundary Viewer Printout and Tree Height-DBH Graph.

SUBSECTION R.4.1 GENERATING THE PLOT DATA PRINTOUT

1. Open the MIDAS Control Panel
2. Select 'Print Field Plots'. This opens a list of files in the Work folder.
3. Select the file(s).
4. Ensure the 'Errors and Warnings' box is checked.
5. Select the radio button for “Print & PDF” or “PDF only”.
6. Select 'Print'.



7. The plot printout file will be automatically named as <MIDASfilename>.PLOTDATA.PDF
8. This file will automatically save in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>
9. MIDAS will automatically create this folder when selecting 'Print'.
10. Anytime changes are made to data in the MIDAS plot file, a new PDF must be 'printed'. This will overwrite the existing file. Ensure the current version is closed before 'reprinting' the PDF; otherwise, it will not update properly.

SUBSECTION R.4.2 BOUNDARY VIEWER

When printing a plot from MIDAS Control Panel, the Boundary Viewer will be embedded on one of the last pages of the plot data printout. Review the mapping and verify all boundary references are correct, follow condition class mapping rules per Chapters 5 and 7, and accurately represent the area of the condition classes on plot. Compare the Boundary Viewer to the mapping on the back of the plot card to ensure consistency but remember that the plot card mapping should show conditions as they occur on the ground (see Subsection R.6.5) while boundary mapping in MIDAS is more limited. Tally tree locations are also present and can be reviewed for proper condition class designation as well as amount and general location on plot.

SUBSECTION R.4.3 TREE HEIGHT-DBH GRAPH

When printing a plot from MIDAS Control Panel, the Tree Height-DBH Graph is embedded on one of the last pages of the plot data printout. It is another tool used to aid the editing process. Inspect the graph for outliers, anomalies and abnormalities in the data resulting in improbable DBH/Length combinations. These are often due to typos (e.g. a sapling 1.5-inch DBH coded as 300 feet tall). Unlikely combinations may also be a result of unusual circumstances or injury to the tree. Confirm these have the appropriate damage agent or TREE NOTE. The graph can also be used to discern size cohorts in the tree data and to inform discussion of growth trends in the PLOT NARRATIVE.

SECTION R.5 PLOT EDIT

Go through each item in the tables below. Make updates directly in the electronic data file and check off each edit as it is completed. **It is a requirement to complete this Plot Edit Sheet prior to submitting a plot.** When submitting a plot, you are validating the following edit checks are complete. Provided for reference are the MIDAS codes for each data item as they appear on the plot printout (*in italics*) and field manual page numbers to specific data items.

Detailed instructions for plot cards, image files, and landowner reports/contact forms are contained in Section R.6-Section R.8.

SUBSECTION R.5.1 SAMPLED WITH ACCESSIBLE FOREST OR MEASURABLE NONFOREST

Complete the following edits when a plot is coded as PLOT STATUS = 1 (page 53) or PLOT STATUS 2, NONFOREST SAMPLING STATUS = 1, and NONFOREST PLOT STATUS = 1 (page 54).

Plot Card

Verify header is filled out completely and legible. If scanned, verify entire plot card is legible.	☐
Verify header info matches data printout (i.e. personnel on plot, date, Hex, County).	☐
Review Plot Access sketch map. Is it required per Subsection R.6.4 PLOT ACCESS: LOCATION SKETCH MAP? The following are reasons a plot sketch map is required: 1.Plot inaccessible 2.Plot viewed from a distance 3.Stocking check completed with phantom subplots if yes to any of the above, is it present and legible? Refer to Plot Narrative, Sample Method, Plot Status and Plot Nonsampled Reason, Canopy Cover Sample Method to verify the location sketch map is necessary and correct.	☐
Verify State and HEX number are correctly labeled on back.	☐
Are conditions correctly mapped per Subsection R.6.5 MAPPING? Boundaries drawn as they appear on the ground (i.e. not a replica of the boundary viewer diagram) Is each condition at least described by Condition Class Number, Forest Type, and Stand Size?	☐

Image

Is the inventory year label accurate? It should say Field Season Year 2022 at the top.	☐
Is the RP symbol correct? If the RP is too close to label or located off the image, did the crew state this on the image? Verify that the RP Data supports this. RP is only required in certain instances, see page 60.	☐

If applicable, does the RP symbol location match the RP AZIMUTH and HORIZONTAL DISTANCE?	☐
If there is a POD, is the correct symbol used and does it match details described in the PLOT ACCESS DESCRIPTION?	☐
Was the PC crosshair corrected with the appropriate symbol when applicable? Are the required notes recorded for GPS LOCATION TYPE 3 (*code LOC,* page 67) per Subsection R.7.1: PLOT CENTER LOCATION?	☐

NOMS Current Plot Report/Landowner Contact Form

Check plot and owner level condition lists. Is a condition list accurate for each landowner? If there are multiple conditions and multiple owners on plot, the condition class number is specific to each owner (e.g. not coding all conditions for each owner, unless applicable).	☐
Is plot center assigned to one landowner?	☐
Make sure Owner Type for condition one is not marked as 'Access Only'.	☐
If the plot requires permission from an access-only owner, ensure this owner is listed as a separate record in NOMS. Any contacts for the 'Access Only' owner should be associated with that owner and not added to any 'Plot Owner' records.	☐
Does each landowner have a contact?	☐
If condition is a public road, river, or land not requiring access permission, there is an Owner and Contact record for the condition.	☐
If condition does not require access permission, there is an Owner Contact Note stating, "access permission not required."	☐
Is a contact event recorded for each landowner from whom permission is required and does access status = granted or denied?	☐
If a contact denies access, make sure the specific individual who denies, the method of denial (letter, phone, email, etc.), and details of the interaction are recorded in the contact event.	☐
If landowner requests data the data request box is checked (only for single owner conditions).	☐
Make sure contact and contact events are recorded under the correct owner (not mismatched when multiple owners exist).	☐
If an owner record, contact or contact event is updated, verify a <u>new</u> NOMS report is generated <u>each</u> time.	☐

Data Printout

MIDAS Validations: Review all warnings. Look for and correct any errors in the data.	☐
Midas Validations: Review all critical warning explanations. Do they make sense with the data? Are there any typos? Are explanations ambiguous, unclear, or irrelevant? Explanations need to be clear and address the stated issue; "see plot notes" or similar is not sufficient. Do not use abbreviations in explanations.	☐
Boundary Viewer Diagram: Is it present and legible? Do the boundaries follow condition mapping rules?	☐
Ht-DBH Graph: Is it present and legible? Check for outliers. If there is an outlier, check diameter and length for gross errors. If outlier is observed, make sure there is an explanation in TREE NOTES.	☐
Review all data NOTES fields to ensure: • they are clear and sufficient and do not include abbreviations • they support the data and/or explain anomalies in the data	☐

PREVIOUS PLOT MAPPING OR CONDITION ERROR (page 56): This data item is the code MAPER. It acts as a trigger variable allowing entry into the previous condition data screen to make updates. There is also a MAPER code within each subplot acting as a trigger variable to allow updates to previous data at the subplot and boundary level. Refer to the MAPER TABLE in Appendix S for generic situations of when to code MAPER Y or N.

When condition classes were recorded out of order, do not renumber them from how they were previously coded unless the situation requires it (CONDITION CLASS NUMBER, page 96). This creates complications and usually results in the data recorded incorrectly. Remember to correct errors first, and then add any new condition classes as they are encountered when completing a plot.

Map Error and Change Matrix

Cross check current condition data with the previous condition data. Refer to notes in the PLOT NARRATIVE (page 63), Change Matrix, Subplot data and Boundary data. Use previous data printouts for additional reference.	1. If PREVIOUS CONDITION CLASS STATUS (page 97, PREVIOUS RESERVED STATUS (page 101), or PREVIOUS OWNER GROUP (page 103) are changed to <u>correct an error:</u> a. Plot MAPER should be Y (yes) b. Verify there is a detailed note in that previous condition record explaining the situation. c. If the previous condition was deleted to correct an error, make the explanation in PLOT NOTES. d. It is critical the note describes what the error was. e. Do not just note 'previous crew was wrong'.	☐
	2. If CONDITION STATUS, RESERVED STATUS or OWNER GROUP are different than the previous data because there has been <u>real, physical on the ground change</u>: a. Plot MAPER should be N (no) b. Check the reconcile codes and notes in the Change Matrix. Physical change should be coded as 1 and have a detailed note explaining the situation. For example, if a new road was built since the previous inventory, state this and provide the year the road was put in.	☐
	3. If CONDITION STATUS, RESERVED STATUS or OWNER GROUP are different than the previous data because there has been a <u>procedural change</u>: a. Plot MAPER should be N (no) b. Check the reconcile codes and notes in the Change Matrix. Make sure they are correct. Procedural change should only be coded when one of the situations listed in Table 5.1 (page 91) occurs. c. Also verify the PROCEDURAL CHANGE REASON CODES (page 97, page 102, page 103) are recorded correctly. Any coded as 99 should have a corresponding note that matches one of the situations from Table 5.1.	☐
	4. If CONDITION STATUS, RESERVED STATUS or OWNER GROUP are different than the previous data check their Reconcile Codes (page 97, page 102, page 103) and notes in the Change Matrix. a. If there is a reconcile code other than 0 and the Change Matrix notes say the change is due to an error (or alludes to it), then the data is not coded correctly. MAPER should be Y and previous data corrected accordingly. b. You should only be coding data in the Change Matrix if there has been real, physical on the ground change or procedural change (page 91, Table 5.1).	☐
Cross check FOREST TYPE (*code FTPE,* page 104), STAND SIZE (*code STSZ,* page 104), REGENERATION STATUS (*code REGEN,* page 105), and TREE DENSITY (*code DENS,* page 106) with their previous data counterparts.	1. Plot MAPER should be N when there is any change to these data items regardless if it is due to previous crew error, real change or procedural change.	☐
	2. If any have changed since the previous inventory, make sure there is an explanation in the notes field for that condition record, if not obviously explained in the data (e.g. if stand size went from 3 to 0, there should be a treatment or disturbance coded that would explain the change and therefore a note is not necessary).	☐

Plot Data

Verify QA STATUS (*code QAST*, page 50) is correct.	☐
Verify CREW TYPE (code CREWT, page 50) is correct and all crew member's numbers are in the data. When the crew leader is present on plot, their name should be in the Crew Number 1 field (*code CRU1*, page 51).	☐

Verify HORIZONTAL DISTANCE TO IMPROVED ROAD (*code RDIS,* page 57) is not obviously wrong (i.e. typo) by referring to Plot Directions, maps, imagery, local knowledge.	☐
If any sources of water within the 24-foot radius subplots are indicated (e.g. on plot card mapping, plot narrative, subplot notes, etc.), make sure that WATER ON PLOT>0 (*code WAT*, page 58).	☐
Read PLOT ACCESS DESCRIPTION. Directions start from the intersection of 2 highways identified by a name or a number; or if Wilderness, a trailhead or the end of local road is identified, and nearest town is noted. The directions also end at POD, parking location, RP, or PC and they include a description of route to PC if it is not near the parking location. Verify consistency with plot sketch map if it is included on plot card. If RP data is noted, then verify with recorded RP data when RP TYPE>0.	☐
Read PLOT NARRATIVE. Key in on number of conditions, forest type, stand size, stand age, disturbances, treatments, vegetation composition and any other descriptions. Verify consistency with recorded data.	☐
Verify the PLOT NARRATIVE and PLOT ACCESS DESCRIPTION are in the correct data fields.	☐
Verify the date in the data is the day when the plot was completed in the field, and that it matches the date on the plot card.	☐
CA only: If Sudden Oak Death samples were collected (*code SOD* = Y, page 59), samples & original PDR slip were shipped for testing to Rizzo lab. PDR number stickers match on the samples and the PDR slip. Scan of original copy emailed or mailed to CA Coordinator per instructions.	☐

GPS Data

When real-time plot center coordinates cannot be collected, GPS UNIT TYPE = 0 and GPS LOCATION TYPE = 3 (*code LOC,* page 67), there is a viable reason and notes explaining the situation. Were directions in Item 4.4.3.6 GPS LOCATION TYPE followed?	☐
Verify there is a note for GPS LOCATION TYPE 3 (*code LOC,* page 67) explaining the situation if the Digital Image plot center location or aerial photo pinprick is incorrect.	☐

RP Data

Verify RP Data is consistent with PLOT ACCESS DESCRIPTION, PLOT NARRATIVE, or Plot Card Mapping when RP TYPE>0 (*code RPTYPE*, page 60).	☐
If applicable, review RP NOTE for typos; and if RP AZIMUTH and RP HORIZONTAL DISTANCE (*codes RPAZ and RPDS*, page 61 and page 61) were collected with GPS, there is an RP NOTE stating this.	☐
If RP not visited or not updated, RP Type = 0. Only applicable per instructions in Subsection 4.3.7.	☐

Site Tree Data

SITE TREE NOTES only pertain to that particular site tree record. Do not include notes about site trees pertaining to the entire plot or a condition class. Those types of notes should be recorded in PLOT NOTES.	☐
Check each site tree note. Old site trees copied and used as a new site tree have a SITE TREE saying 'copied as new'.	☐
Verify all invalidated site trees have a SITE TREE NOTE explaining why (e.g. wrong species, site index too low, etc.).	☐
The CONDITION CLASS LIST for invalidated site trees reflect all conditions the tree currently represents (could be a different condition list than at the previous inventory). (*code CONL,* page 244)	☐
When there are no site trees recorded for a condition make sure there is a PLOT NOTE stating this with a description of the site's general topography, moisture regime and substrate material. This note should be brief but still provide the necessary information. It is so users of the data have additional information to assign a site class to the condition.	☐
When a complete set of site trees cannot be collected for a condition make sure there is a PLOT NOTE describing the reason why a complete set was not available.	☐
When a plot is in the Kings Method Zone (page 239) and the required number of site trees cannot be collected, primary method is used for SITE TREE SELECTION METHOD (*code METH,* page 246).	☐
Check the QUESTIONABLE SITE TREE FLAG (*code QUES,* page 244)). If the value is 0, then a good explanation pertaining to the specific site tree is recorded in the SITE TREE NOTE.	☐
If a site tree is collected as a 'last resort' (page 241), there are no additional site trees collected for that condition class. Last resort site trees must have QUESTIONABLE SITE TREE FLAG (*QUES*) = 0 with a SITE TREE NOTE explaining why (e.g. tree is >250 years old, tree age extrapolated, or tree has damages that do not affect height growth).	☐
If only one or two site trees are collected because no other are available *QUES* can be 1 if the site trees are good.	☐

If any downloaded site tree data was updated, check that all of the site tree's data items were updated appropriately (e.g. if age is updated to current age, then height must also be updated to current height)	☐
Ensure that there are no more than the correct number of site trees collected for the corresponding method (Kings, Primary, or CA Mixed Conifer). Delete extra site trees, adhering to the hierarchical site tree selection criteria.	☐

Condition Class Data

Verify Condition Class Data is consistent with PLOT NARRATIVE.	☐
Review FOREST LAND CONDITION STATUS CHANGE code (*code FCSC*, page 98) for accuracy.	☐
Is the plot in a reserved area? Check Appendix N and the RESERVED STATUS (*code RESV*, page 101) for each condition class.	☐
On SAMPLE KIND = 2 plots, if FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, or TREE DENSITY data items are different than the previous data due to previous crew error, or not otherwise explained in the data make sure there is a CONDITION CLASS NOTE explaining if the change is real change or previous crew error for that condition class record.	☐
If a stand is relatively undisturbed and PREVIOUS STAND AGE seems correct, update STAND AGE (*code SAGE*, page 112) by adding the number of years since the previous inventory and use AGE BASIS CODE 40 (*code AGEBS*, page 112). Check the date of the previous inventory because some plots were carried over for one or two years and may not have been completed ten years ago.	☐
If a forested condition was added to the previous data because it was missed at the last inventory and no disturbances or treatments occurred that affect STAND AGE, make sure PREVIOUS STAND AGE is the correct number of years less than current STAND AGE.	☐
Cross check each condition's PHYSIOGRAPHIC CLASS (*code PHYS,* page 113) with what is coded in the subplot data. Make sure there is an explanation in SUPLOT NOTES if they are different or there is an outlier.	☐
DISTURBANCEs (*code DIS,* page 120*)* and TREATMENTs (*code TRT,* page 125): Verify disturbance and treatment dates with observations on the ground, previous plot data, and whenever possible discussions with landowners, or use GIS layers and other imagery sources that show a time lapse.	☐
Cross-check recorded CONDITION FUELBED TYPE (*code FUEL*, page 117) with Scott and Burgan (RMRS-GTR-153) descriptions. Verify the recorded CONDITION FUELBED TYPE is reasonable for the condition. For measureable nonforest improved roads, verify CONDITION FUELBED TYPE is the same as the adjacent condition.	☐
Verify recorded COVER CLASS (*code CC*, page 131) is consistent with recorded LIVE CANOPY COVER (*code LCCV*, page 142).	☐
PLANT ASSOCIATION (*code PLTAS*, page 133, R6 only): Plant association provides an indication of the seral stage of a plant community and can also be used to infer information about ecosystem productivity, management considerations, and wildlife habitat. Use the key in the appropriate PLANT ASSOCIATION PUBLICATION (*code PLTPU*, page 135*)* for the forest region in which the plot is located to choose a code that best represents the forest type and plant communities observed on plot. If one is listed from the previous inventory, verify and update it if necessary.	☐

Subplot Data

When SUBPLOT PIN FOUND = 0 and witness or tally trees were not used to re-establish subplot center, a note describes how it was re-established (*code SUBPN*, page 158).	☐
Verify SUBPLOT MAPER is coded correctly according to scenarios in Appendix S, Maper Table.	☐
Unlisted trees have an UNLISTED TREE NOTE that describes the species as well as what sources were used to identify it (page 158).	☐

P2 Veg Species Data

Check unknown and genus species codes. If the common name is recorded in the notes field, make sure to update to the correct species code. Verify that unidentified species or any records at genus level have notes describing them.	☐
Check unknown and genus species codes. If a sample was collected for identification later, attempt to identify it and update to the correct species code. All shrubs should be identified to the species level.	☐
Verify recorded SPECIES VEGETATION LAYERS are reasonable for the species.	☐
Verify if a non-tally tree species is recorded as LT or SD growth habit, that it is also represented in Veg Structure as Non-Tally Tree.	☐
Verify all recorded species are reasonable for the geographic location.	☐

Tree Data

CONDITION CLASS NUMBER(*code CON#*, page 177) assigned to each tree matches the actual condition the tree belongs in. Sometimes boundaries are adjusted to represent the actual area due to mapping limitations in the MIDAS program. Use the boundary viewer printout or use the boundary view option in the boundary screen in MIDAS along with the real on the ground drawing on the plot card to aid in verification. Trees can only be assigned to a condition in the SUBPLOT CONDITION LIST (*code CLST*, page 156).	☐
If previously forested land (Previous CDST = 1) has changed to nonforest land (current CDST = 2), all previously tallied trees in the condition are assigned the appropriate PRESENT TREE STATUS: 1, 2 or 3. Pay particular attention to PRESENT TREE STATUS 2 or 3 (*code TRST,* page 178).	☐
Review all TREE RECONCILE codes (*code RECON,* page 181) and verify they are recorded correctly per Appendix F, Tree Coding Guide.	☐
Anytime a previous diameter nail was missing, moved, or determined to be incorrect at the previous visit, DIAMETER CHECK CODE (*code DCHE*, page 208) must be 2, a TREE NOTE is recorded explaining the situation and PREVIOUS DIAMETER (*code PDBH*, page 205) is updated if appropriate.	☐
Review Tree lengths for any unexplained reductions >20% from PREVIOUS TOTAL LENGTH (code PTOT, page 216) and make sure there is a note describing the situation.	☐
Previously tallied snags (*code PST* = 2) have an appropriate PREVIOUS TOTAL LENGTH (*code PTOT*, page 216). This should be determined in the field based on the other trees on plot. Use the Tree HT-DBH graph if the recorded value from the field does not make sense.	☐
Review all recorded damages. Is ROTTEN/MISSING CULL (*code MISS*, page 226) or ROUGH CULL (*code RGHC*, page 228) appropriately recorded?	☐
When CAUSE OF DEATH = 70 (*code CAUS*, page 230), there is a TREE NOTE describing it. "Unknown" is an acceptable note, but if the note alludes to a cause of death, it should be coded as such.	☐
Tree MORTALITY YEAR (*code MTYR*, page 231) matches Condition DISTURBANCE/TREATMENT YEAR when applicable (e.g. if harvested since the previous inventory).	☐
Review all TREE NOTES. Are all tree notes consistent with the recorded tree data? Do any tree notes elude to an error in the recorded tree data? Are there any typos in the tree notes? Are any notes ambiguous or unclear to someone that is not on plot? Do not use abbreviations in TREE NOTES.	☐

DWM

DWM TRANSECT LINE SEGMENTING (page 252): If condition breaks exist, are they realistic compared to the Boundary Mapping Data? If not, there are notes explaining why.	☐
When multiple conditions exist on a transect, verify CWD CONDITION CLASS (*code COND*, page 259) for each piece of CWD is assigned to the correct condition on the ground. Use Boundary Mapping Data as a guide.	☐
Verify CWD SPECIES (*code SPCD*, page 261) codes are appropriate for the species recorded on plot and found in the condition.	☐
Duff and Litter Data: when DUFF AND LITTER METHOD = 4 (*code METH*, page 276) notes clearly explain the situation.	☐

SUBSECTION R.5.2 SAMPLED ENTIRELY NONFOREST PLOTS

Complete the following additional edits when a plot is coded as PLOT STATUS = 2 (page 53)

Plots that are inaccessible but entirely nonforest are coded as PLOT STATUS = 2 (*code PLSTA*, page 53).	☐
Verify the date in the data matches the date on the plot card.	☐
Ensure the PLOT NARRATIVE (page 63) includes a description of the predominant vegetation cover present. Indicate whether or not you think the plot will convert to forest land in the future.	☐
If the plot was viewed from afar, the azimuth and distance from the viewpoint to plot is included in the PLOT ACCESS DESCRIPTION (page 62).	☐
If previously forested land (Previous *CDST* = 1) has changed to nonforest land (current *CDST* = 2), all previously tallied trees are assigned the appropriate TREE STATUS: 1, 2 or 3 (*code TRST,* page 178).	☐
Review FOREST LAND CONDITION STATUS CHANGE code (*code FCSC*, page 98) for accuracy.	☐
Verify recorded COVER CLASS (*code CC*, page 131) is consistent with recorded LIVE CANOPY COVER (*code LCCV*, page 142).	☐
For developed conditions, verify LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER (*code LMCC*, page 142) are the same.	☐

SUBSECTION R.5.3 NONSAMPLED PLOTS WITH POSSIBILITY OF FOREST LAND

Complete the following additional edits when a plot is coded as PLOT STATUS = 3 (page 53)

Make sure SAMPLE METHOD CODE is recorded correctly (*code METH*, page 50). Unless the plot was field visited or viewed from a vantage point it will most often be 3 because aerial photos and digital imagery are used to assess the forest land call in addition to previous inventory data.	☐
If SAMPLE METHOD CODE = 4, make sure there is a PLOT NOTE describing what was used to make the condition call.	☐
Verify the date in the data matches the date on the plot card.	☐
When SAMPLE KIND = 2, CONDITION STATUS RECONCILE CODE = 1 (real change) for each subplot (Change Matrix *code CDSTR*, page 97) with a detailed note describing the situation.	☐
Verify recorded COVER CLASS (*code CC*, page 131) is consistent with recorded LIVE CANOPY COVER (*code LCCV*, page 142).	☐
For developed conditions, verify LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER (*code LMCC*, page 142) are the same.	☐

SECTION R.6 PLOT CARD

The plot card serves as a cover sheet containing different pieces of information pertaining to an individual plot and is loaded as part of the Electronic Plot Folder. Blank plot card files are included in the Prefield package. A copy of the plot card can also be found in Appendix T, Plot Forms. Fill out each plot card per the instructions below. This can be done by hand or electronically in Microsoft Word. Mapping can be drawn by hand on the plot card while in the field and scanned back in the office. Make sure the file is in PDF format and named correctly.

When complete, save a copy as <MIDASfilename>.PLOTCARD.PDF

Save in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>

SUBSECTION R.6.1 HEADER

The HEADER is located at the top of the plot card and contains the following parts: PLOT NUMBER, STATE, COUNTY, DATE, CREW LEADER and CREW. Fill in the PLOT NUMBER, state name and number, county name and number, date the plot was completed in the field, the crew leader name, and names of all crew members who completed the plot. All people should be identified by their first initial and last name.

SUBSECTION R.6.2 HAZARDS OR SAFETY CONCERNS

This is located under the HEADER. Describe any hazards encountered during travel to plot, while on plot or any safety concerns for anyone who may visit the plot in the future.

SUBSECTION R.6.3 ACCESS NOTES

This is located under the HAZARDS OR SAFETY CONCERNS. It is for any pertinent information a QA, COR, or future crew may need to access the plot. It is not a copy of the PLOT ACCESS DESCRIPTION, but rather a place to state if there are any gates or keys required, if a permit is required, whether the plot requires backpacking or car camping, etc. This replaces the Y or N boxes on previous plot cards and plot jacket labels.

SUBSECTION R.6.4 PLOT ACCESS: LOCATION SKETCH MAP

This is the box under ACCESS NOTES. It is primarily an area for the crew to draw a sketch map supplementing Item 4.3.8.1, PLOT ACCESS DESCRIPTION (PNW). Provide road/trail names or numbers, mileage between the reference points, any gates or other obstructions blocking road access, the approximate location of the PC and the RP (if applicable), and any other pertinent information to aid a future crew in relocating a plot. If a plot is viewed from a distance, show the viewing location in relation to plot center.

The plot access sketch map is optional for most plots. A sketch may be beneficial to aid future crews in relocating the plot when road maps or imagery are poor, incorrect or unavailable. It can be used when the approximate location of features on the landscape serve as useful spatial references for hiking or driving toward plot or when mileages are unreliable. The sketch may be used to describe attempted routes that should be avoided. Also, it can provide information about the surrounding landscape to steer crews toward best routes and away from hazards.

The plot location sketch map is required for the following situations:

1. When a plot is attempted and deemed inaccessible, to visually document attempted routes in and must include mention of the hazards as well as where they are located along the access route into a plot. This must be thorough and will aid reviewers and future crews in deciding whether a plot will return to the field in the next annual inventory cycle.
2. When a plot is viewed from a distance it must show the route in and where a plot is viewed from in relation to plot center.
3. When a cover/stocking check is conducted, this space must be used to communicate where phantom subplots were installed. Document phantom subplot locations in relation to the standard four-point layout.

SUBSECTION R.6.5 MAPPING

This is the dot map on the back side of the plot card. Fill in the state abbreviation and plot number. Draw in condition class boundaries as they appear on the ground and label each condition class appropriately. This mapping should be a picture of what is found on plot and not just a replica of the boundary viewer diagram. Include a brief description of each condition next to the label. Descriptions should include the following information:

- Condition Class Number
- If accessible forest land the following:
  - Forest Type
  - Stand Size
  - Include Reserved Status, Owner Group, Regeneration Status, Tree Density only if delineating conditions by them
- If nonforest, include the following:
  - Present Nonforest Land Use
  - Include Reserved Status and Owner Group if delineating conditions by them
- If other than accessible forest land or nonforest land, Condition Status is written out (do not just use codes, e.g. Census Water - Pacific Ocean).

For example, CC1 - PSME Plantation 5"-9", CC2 - Improved Road. If the plot is all one condition class, label it as 'All CC1' with a brief description as described above. Also sketch any details, landforms, terrain features or hazards found on or near the plot that may be useful for relocating plot center and for understanding mapping decisions.

SECTION R.7 IMAGES

A digital image file is available in the Prefield package. It is loaded as a part of the Electronic Plot Folder. Images should contain a label with the current field season year; verify for presence and accuracy. The label should be "Field Season Year = 20XX". When complete, save a copy as a JPG or PDF file. The file name should be <MIDASfilename>.IMAGE.JPG or <MIDASfilename>.IMAGE.PDF and saved in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>. MIDAS EPF Uploader will only accept one file type (JPG or PDF). Ensure that only one image file is located in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>.

The following edits must be completed on the image file prior to loading a plot.

SUBSECTION R.7.1 PLOT CENTER LOCATION

A small circle with outer cross hairs located in the center of the image indicates where the plot center stake should be, similar to the pinprick in the old aerial photograph. If field examination and/or survey grade GPS readings show the plot location is incorrect, place a new red dot using the symbol shown below to label the correct location. Record a detailed note in the notes field for GPS LOCATION TYPE 3 explaining the mismatch. If plot center is in the correct location as shown in the image, there is no need to update it.

SUBSECTION R.7.2 REFERENCE POINT (RP) AND POINT OF DEPARTURE (POD) LOCATIONS

Visiting the Reference Point (RP) is only required when SAMPLE KIND = 1 or when SAMPLE METHOD CODE = 1 and PLOT STATUS =2. Therefore, marking the RP on the image file is only required for these plots, following the instructions below. Otherwise, marking the RP on the imagery can be done at the crew's discretion.

Mark the RP location in the plot image file using a red triangle symbol with no fill. If the RP is not on the image or too close to PC to mark, make a brief note next to the inventory year in the upper right corner of the image (e.g. RP too close to pinprick, RP not on image). If using a Point of Departure (POD) mark the location with a red square symbol. It is not a requirement to include RP or POD information (species, DBH, etc.) on the plot image. Include this information as described for RP's in Subsection 4.3.7, Reference Point Attributes. POD information should be included in the PLOT ACCESS DESCRIPTION.

SUBSECTION R.7.3 IMAGE SYMBOLS

Use these symbols to update the plot image file. Size may be adjusted if appropriate. Keep Image symbol lines as thin as possible but still easily viewable on the image. For RP and POD symbols, ensure there is no fill so the object can be seen within the symbol.

Plot Center RP POD

SECTION R.8 LANDOWNER CONTACT FORM AND NOMS OWNER REPORT

All ownership and contact event information is required to be entered into the National Ownership Management System (NOMS). This information should be as detailed as possible to aid office staff and future crews in assessing and contacting landowners for plot access. For each plot owner, the following fields are required: plot and owner level condition lists, owner information, plot center owner status, access status, landowner data request, and detailed contact information such as full name of contact, date/time of contact, method of contact, and all contact events before and after the plot is completed (e.g. 'gate key returned', or 'landowner was notified when plot was completed', or 'landowner was called to confirm historical treatments/disturbances'). The remaining fields should be filled out when applicable.

For every condition delineated on a plot there must be an owner and contact record in the database. The Ownership Condition List must be filled out and each owner only assigned conditions that are mapped on their land.

Export the plot owner report in NOMS. File naming and output location should occur automatically. The file name should be <MIDASfilename>.OWN.PDF and saved in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>.

This is not required for plots contracted by PNW on National Forest lands in California. This is not required for plots contracted by PNW or R6 on National Forest lands, BLM, or DNR lands in Oregon and Washington.

SECTION R.9 TRIMBLE ROVER FILES

Each plot with at least one accessible forest land condition class is required to have survey grade GPS files collected at each subplot center. Refer to Subsection 4.4.1 for instructions on when to collect them and how to code them in the data. Refer to Appendix P, GPS Operating Guide, for instructions on downloading rover files.

Download HPGPS files to C:\Midas\PlotPackets\PNWRS\GPS.

SECTION R.10 LOADING PLOT DATA AND EPF FILES

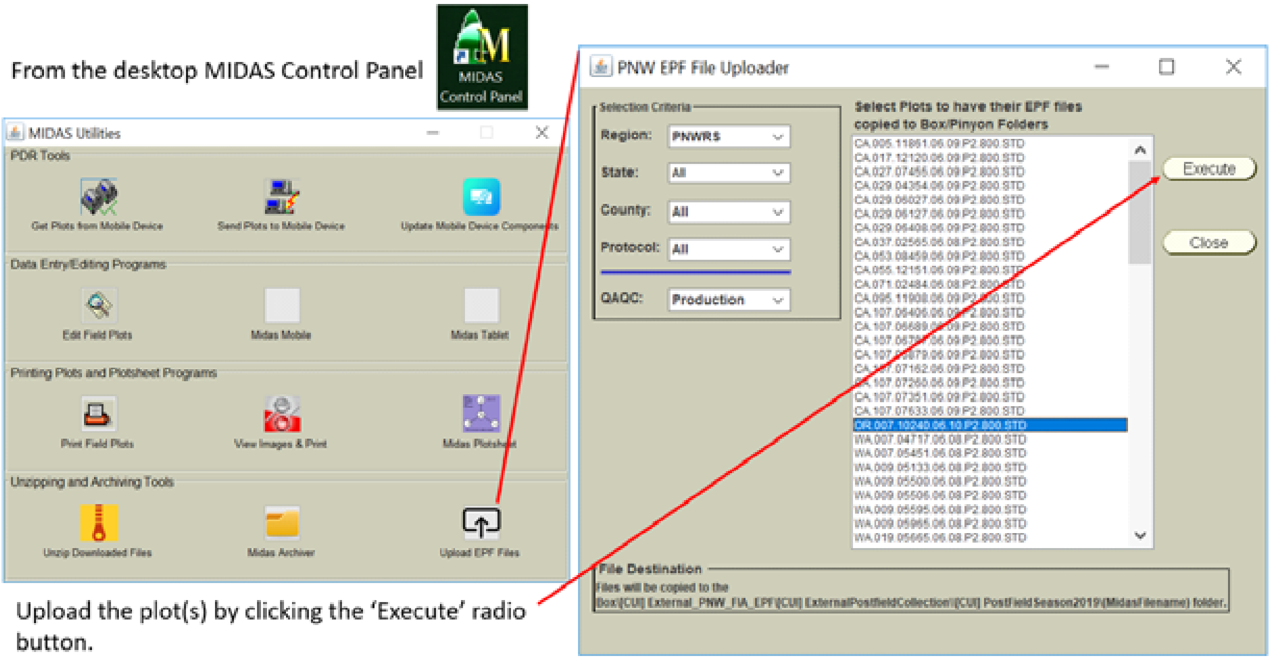
SUBSECTION R.10.1 LOADING PLOT DATA

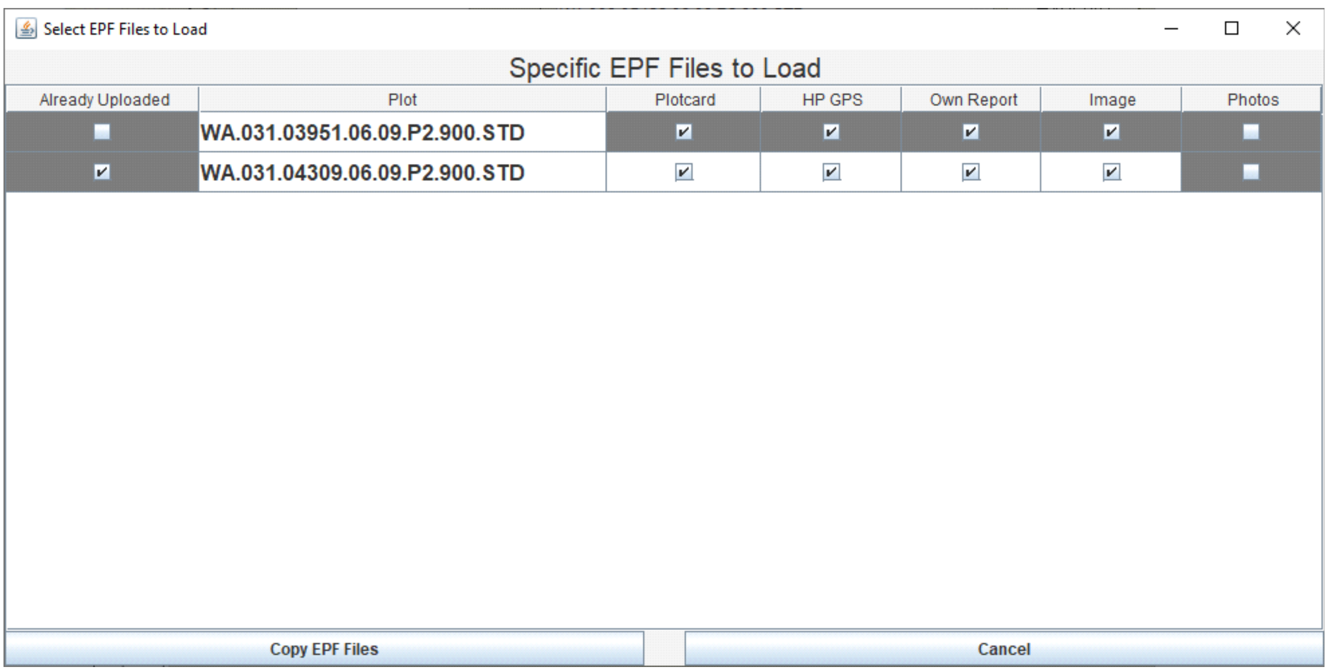
The plot data file is loaded via the MIDAS website (see MIDAS Instructions).

SUBSECTION R.10.2 LOADING EPF FILES

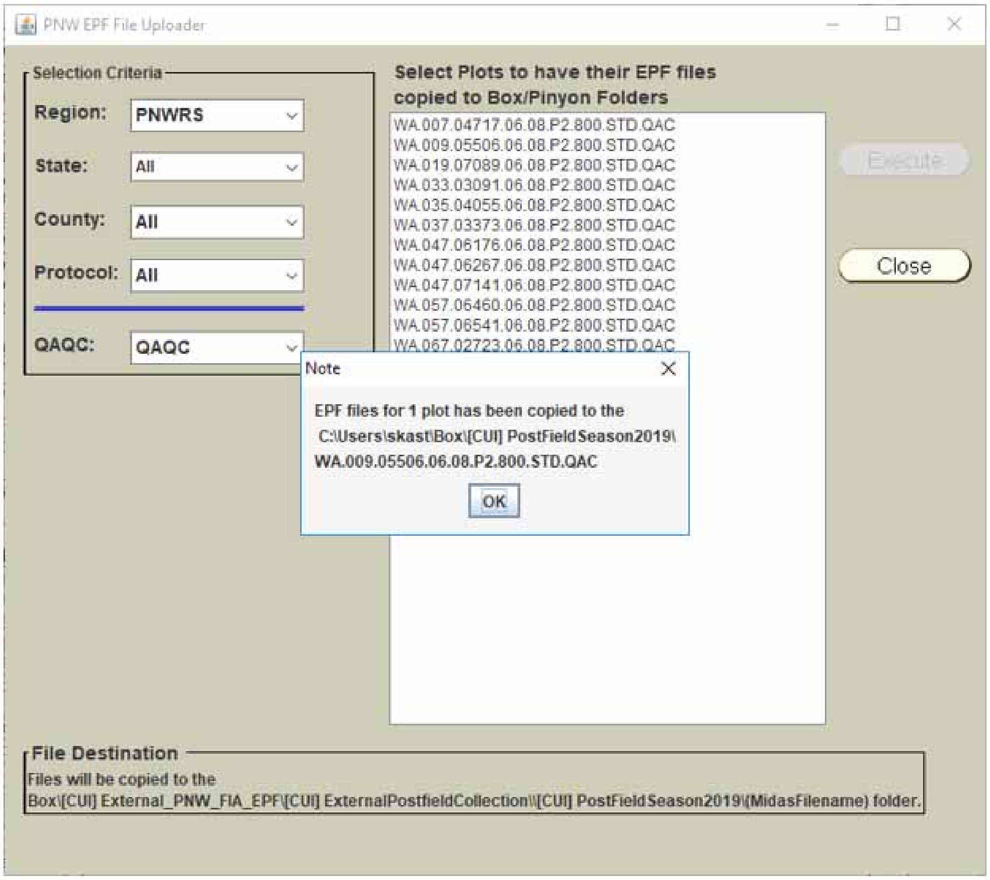
Completed EPF files are stored on Pinyon (Box) and are transferred using MIDAS Control Panel and the EPF Uploader. EPF files stored in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename> and C:\Midas\PlotPackets\PNWRS\GPS will be automatically loaded to designated folders in Pinyon (Box) using this process. Box Drive is required for the EPF Uploader to function.

1. Open the MIDAS Control Panel
2. Select 'Upload EPF files'
3. Select the plot(s) to load.
4. Click the 'Execute' radio button.
5. All required files for the PLOT STATUS (see Section R.11) must be named and stored in the correct folders on the C: Drive for the EPF to load.
6. The plot must edit cleanly (no unresolved errors) for the EPF to load.
7. If the plot has no errors and the required files are present, a table is displayed showing each plot and check boxes next to the files required for upload. If this is the initial load, these boxes are automatically checked and are not editable. If the plot is being reloaded, then the check boxes can be toggled off and on. Only files with checked boxes will be uploaded to Pinyon. Click 'Copy EPF Files' to upload files.
8. After the files have been selected, a popup dialogue box will indicate success. Be aware that this does not mean all files have fully uploaded to Pinyon.
9. The file transfer process may take several or more minutes depending on network speeds. Do not shut down the computer until all files have had a chance to load.
10. If there are edits made to the files following the initial EPF load, the updated files can be loaded using the same process. The completed files stored on Pinyon will be replaced with the updated versions.





Clicking 'Execute' on a plot or plots brings up this table displaying whether the plot has been loaded previously or not. If this is the initial load, then the required files are checked automatically and are not editable (gray). If the plot has been loaded before, then each checkbox is editable (white). Only checked files will upload when 'Copy EPF Files' is selected.



Successful EPF file submission. Wait for several minutes before shutting down computer so files can fully transfer.

SECTION R.11 SUMMARY OF ELECTRONIC PLOT FOLDER FILE NAMES AND FOLDER LOCATIONS

The following lists provide a summary of the required Electronic Plot Folder components, file names and folder locations in order to be submitted.

NOTE: the Plot Data Printout: <MIDASfilename>PLOTDATA.PDF is no longer submitted via the EPF Uploader. It is generated after loading the plot data file to MIDAS Web, then moved into the EPF folder on Pinyon (Box) automatically. It is recommended that field crews still generate the PDF files as part of the plot edit process and save a copy for future reference.

SUBSECTION R.11.1 PRODUCTION PLOTS (PLOT STATUS = 1 OR 2)

The following files should be saved in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>

1. Plot Card: <MIDASfilename>.PLOTCARD.PDF
2. Image file: <MIDASfilename>.IMAGE.JPG or PDF
3. Landowner Report (when applicable): <MIDASfilename>.OWN.PDF or Landowner Contact Form (when applicable): <MIDASfilename>.LCF.PDF

The following files should be saved in C:\Midas\PlotPackets\PNWRS\GPS

4. GPS ROVER Files if collected: State-County-PlotNumber-SP#.JPS or .SSF

SUBSECTION R.11.2 NONSAMPLED PLOTS (PLOT STATUS = 3)

The following files should be saved in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>

1. Plot Card: <MIDASfilename>.PLOTCARD.PDF
2. Image file: <MIDASfilename>.IMAGE.JPG or PDF

3. Landowner Report (when applicable): <MIDASfilename>.OWN.PDF or Landowner Contact Form (when applicable): <MIDASfilename>.LCF.PDF

GPS ROVER files are not required

SUBSECTION R.11.3 BLIND PLOTS

Blind plots have .QAB extension in the file name except for GPS Rover Files only have B (see below). The following files should be saved in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>

1. Plot Card: <MIDASfilename>.QAB.PLOTCARD.PDF
2. Landowner Report: <MIDASfilename>.QAB.OWN.PDF

Image file is not required

The following files should be saved in C:\Midas\PlotPackets\PNWRS\GPS

3. GPS ROVER Files if collected: State-County-PlotNumber-SP#B.JPS or .SSF

SUBSECTION R.11.4 COLD CHECK PLOTS

Cold check plots have .QAC extension in the file name. The following files should be saved in C:\Midas\PlotPackets\PNWRS\Collected\<MIDASfilename>

1. Plot Card: <MIDASfilename>.QAC.PLOTCARD.PDF

Image file, landowner report, and GPS ROVER files are not required.

The following files should be saved in C:\Midas\PlotPackets\PNWRS\GPS

2. GPS ROVER Files if collected: State-County-PlotNumber-SP#C.JPS or SSF

APPENDIX S MAPER TABLE

SECTION S.1 MAPER TABLE

Proper use of this table depends on whether the plot is in its first or second remeasurement cycle. For plots with PREVIOUS DATA CORRECTABLE = Y (first remeasurement cycle), all columns in the table apply. For plots where PREVIOUS DATA CORRECTABLE = N (second remeasurement cycle), only the following columns apply: Scenario and Notes.

	Scenario	Plot Level MAPER	Subplot MAPER	Fix Data?	Notes
1	The plot is one condition and there is an error in previous condition data in CONDITION STATUS, OWNER GROUP, RESERVE STATUS.	Y	N	Update the current and previous data to correct value/s.	Make a note in the CONDITION CLASS NOTES describing which data item was changed and why it was an error.
2	The plot is one condition and there is an error in previous condition data in FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, or TREE DENSITY	N	N	Do not make any updates to previous data. Make sure data in the current condition screen is correct.	Make a note in CONDITION CLASS NOTES describing the error and why there is a discrepancy in previous condition data and current condition data.
3	Previous crew missed a condition based on CONDITION STATUS, OWNER GROUP, or RESERVE STATUS? (No subplot mapping needed / transitional boundary)	Y	Y	Add missed condition to the current and previous condition screens. Change PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value if applicable.	Make a note in SUBPLOT/MACROPLOT NOTES describing why the previous subplot center or previous microplot center changed on the affected subplot. Make a note in the CONDITION CLASS NOTES describing why the condition was added.
4	Previous crew missed a condition based on CONDITION STATUS, OWNER GROUP, or RESERVE STATUS? (Subplot mapping required)	Y	Y	Add missed condition to the current and previous condition screens. Add the boundary data to both the current and previous boundary screens for the affected subplot/s. Use BOUNDARY CHANGE CODE 2 for any missed boundaries. Change PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value if applicable.	Make a note in SUBPLOT/MACROPLOT NOTES describing why the previous subplot center or previous microplot center changed on the affected subplot. Make a note in the CONDITION CLASS NOTES describing why the condition was added. Make a note in BOUNDARY NOTES for all boundaries with BOUNDARY CHANGE code 2 describing why the boundary was added.
5	Previous crew missed a condition based on FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY. (No subplot mapping needed / transitional boundary)	N	N	Do not make any updates to previous data. Add missed condition to the current condition screen only.	Make a note in the CONDITION CLASS NOTES describing why the condition was added.
6	Previous crew missed a condition based on FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY. (Subplot mapping required)	N	N	Do not make any updates to the previous data. Add missed condition to the current condition screen only. Add missed boundaries to the current boundary screen only. Use BOUNDARY CHANGE CODE 2 for any boundaries that were missed.	Make a note in BOUNDARY NOTES for all boundaries with BOUNDARY CHANGE code 2 describing why the boundary was added. Make a note in the CONDITION CLASS NOTES describing why the condition was added.
7	Previous crew erroneously added a condition based on CONDITION STATUS, OWNER GROUP, or RESERVE STATUS (No subplot mapping needed / transitional boundary)	Y	Y	Delete the condition from the current and previous condition screens. Change the PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value.	Make a note in SUBPLOT/MACROPLOT NOTES for the affected subplot. Make a note in the PLOT NOTES describing the situation.
8	Previous crew erroneously added a condition based on CONDITION STATUS, OWNER GROUP, or RESERVE STATUS (Subplot mapping required)	Y	Y	Delete the added condition from the current and previous condition screens. Delete the boundary data from both the current and previous boundary screens for the affected subplot/s. Change PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value if applicable.	Make a note in SUBPLOT/MACROPLOT NOTES for the affected subplot. Make a note in the PLOT NOTES describing the situation.

Section S.1: *MAPER TABLE*

	Scenario	Plot Level MAPER	Subplot MAPER	Fix Data?	Notes
9	Previous crew erroneously added a condition based on FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY.(No subplot mapping needed / transitional boundary)	N	N	Do not make any updates to previous data. Do not add the erroneous condition to the current condition screen.	Make a note in the PLOT NOTES describing the situation.
10	Previous crew erroneously added a condition based on FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY. (Subplot mapping required.)	N	N	Do not make any updates to previous data. Do not add the erroneous condition to the current condition screen. Delete the boundaries in the current boundary screen. Do not delete previous boundaries.	Make a note in the PLOT NOTES describing the situation. Make notes in SUBPLOT / MACROPLOT NOTES for any affected subplots.
11	Previous crew correctly coded all conditions but forgot to map a condition on a subplot. The contrasting condition differs from the condition at subplot center in CONDITION STATUS, OWNER GROUP, or RESERVE STATUS.	Y	Y	Add the boundary data to both the current and previous boundary screens for the affected subplot/s. Use BOUNDARY CHANGE CODE 2 for any missed boundaries. Change PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value if applicable.	Make a note in BOUNDARY NOTES for all boundaries with BOUNDARY CHANGE code 2 describing why the boundary was added. Make a note in SUBPLOT/ MACROPLOT NOTES for the affected subplot.
12	Previous crew correctly coded all conditions but forgot to map a condition on a subplot. The contrasting condition differs from the condition at subplot center in FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY.	N	N	Do not make any updates to previous data. Add the missed boundaries to the current boundary screen only. Use BOUNDARY CHANGE CODE 2 for any missed boundaries.	Make a note in BOUNDARY NOTES as to why the BOUNDARY CHANGE CODE is 2.
13	Previous crew correctly coded all conditions but erroneously mapped a condition on a subplot. The contrasting condition differs from the condition at subplot center in CONDITION STATUS, OWNER GROUP, or RESERVE STATUS.	Y	Y	Delete the boundaries from the current and previous boundary screens. Change PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value if applicable.	Make a note in SUBPLOT/MACROPLOT NOTES for the affected subplot.
14	Previous crew correctly coded all conditions but erroneously mapped a condition on a subplot. The contrasting condition differs from the condition at subplot center in FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY.	N	N	Do not make any updates to previous data. Delete the boundary from the current boundary screen only.	Make a note in SUBPLOT/MACROPLOT NOTES for the affected subplot.
15	Crew mapped on a subplot but has a mapping error of <10% area for any of the 3 radii (and it's not a presence/ absence scenario).	N	N	Do not make any updates to the boundaries.	Make a note in SUBPLOT/MACROPLOT NOTES if the error is close to the 10% threshold.
16	Crew mapped on a subplot but has a mapping error of <10% area for any of the 3 radii (and it is a presence/ absence scenario). The contrasting condition is delineated based on CONDITION STATUS, OWNER GROUP, or RESERVE STATUS.	Y	Y	Update the current and previous boundaries to remove or add the presence/absence of this boundary. Use BOUNDARY CHANGE CODE 2 for any boundaries that were updated. Change PREVIOUS SUBPLOT CENTER CONDITION and PREVIOUS MICROPLOT CENTER CONDITION on the affected subplot/s to the correct value if applicable.	Make a note in BOUNDARY NOTES as to why BOUNDARY CHANGE CODE is 2. Make a note in SUBPLOT/MACROPLOT NOTES for the affected subplot.
17	Crew mapped on a subplot but has a mapping error of <10% area for any of the 3 radii (and it is a presence/ absence scenario). The contrasting condition is delineated based on FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS or TREE DENSITY.	N	N	Do not update the previous boundaries. Change the current boundaries only to boundaries to remove or add the presence/absence of this boundary. Use BOUNDARY CHANGE CODE 2 for any boundaries that were updated.	Make a note in BOUNDARY NOTES as to why BOUNDARY CHANGE CODE is 2. Make a note in SUBPLOT/MACROPLOT NOTES when boundaries are deleted.
18	Crew mapped on a macroplot/subplot/microplot but had a mapping error of ≥10% on one of the 3 radii which resulted in a change of CONDITION STATUS, RESERVE STATUS, or OWNER GROUP.	Y	Y	Update the current and previous boundaries to the corrected value/s. Use BOUNDARY CHANGE CODE 2 for any boundaries that were updated.	Make a note in BOUNDARY NOTES as to why BOUNDARY CHANGE CODE is 2. Make a note in SUBPLOT/MACROPLOT NOTES for the affected subplot.

	Scenario	Plot Level MAPER	Subplot MAPER	Fix Data?	Notes
19	Crew mapped on a macroplot/subplot/microplot but had a mapping error of ≥10% on one of the 3 radii which <u>did not</u> result in a change of CONDITION STATUS, RESERVE STATUS, or OWNER GROUP.	N	N	Do not update the previous boundaries. Change the current boundaries to the corrected value/s. Use BOUNDARY CHANGE CODE 2 for any boundaries that were updated	Make a note in BOUNDARY NOTES as to why BOUNDARY CHANGE CODE is 2.
20	There has been real change and the resulting difference in the mapped area is <10 %.	N	N	Do not update the previous boundaries. Change the current boundaries to the new values. Use BOUNDARY CHANGE code 1	Make a note in BOUNDARY NOTES as to why BOUNDARY CHANGE CODE is 1.
21	There has been real change and the resulting difference in the mapped area is >10 %.	N	N	Do not update the previous boundaries. Change the current boundaries to the new values. Use BOUNDARY CHANGE code 1	Make a note in BOUNDARY NOTES as to why BOUNDARY CHANGE CODE is 1.

APPENDIX T PLOT FORMS

SECTION T.1 PLOT FORMS

SUBSECTION T.1.1 PLOT LEVEL DATA

Item 4.2.1.1	STATE	
Item 4.2.1.2	COUNTY	
Item 4.2.1.3	PLOT NUMBER	
Item 4.2.1.4	CYCLE	
Item 4.2.1.5	SUBCYCLE	
Item 4.2.1.6	PERIODIC PLOT NUMBER	
Item 4.2.1.7	NFS PLOT NUMBER	
Item 4.2.1.8	FIELD GUIDE VERSION	
Item 4.2.1.9	PDR STARTING DATA RECORDER VERSION NUMBER	
Item 4.2.1.10	PDR ENDING DATA RECORDER VERSION NUMBER	
Item 4.2.1.11	DECLINATION	
Item 4.2.1.12	MACROPLOT BREAKPOINT DIAMETER	
Item 4.2.1.13	CHANGE MATRIX REQUIRED	
Item 4.2.1.14	PREVIOUS DATA CORRECTABLE	
Item 4.2.1.15	P2 VEGETATION SAMPLING STATUS	
Item 4.2.1.16	LEVEL OF DETAIL	
Item 4.2.1.17	INVASIVE PLANT SAMPLING STATUS	
Item 4.2.1.18	INVASIVE PLANT SPECIMEN COLLECTION RULE	
Item 4.2.1.19	DWM SAMPLING STATUS	
Item 4.2.1.20	SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED	
Item 4.2.1.21	SPECIAL STUDY AREA	
Item 4.2.1.22	URBAN AREA	
Item 4.2.1.23	NATIONAL FOREST REGION	
Item 4.2.1.24	YEAR OF PREV INVENTORY	
Item 4.2.1.25	MONTH OF PREV INVENTORY	
Item 4.2.1.26	PREV GROUND LAND CLASS	
Item 4.2.1.27	PHASE	
Subsection 4.2.2 Special Studies		
Item 4.2.2.1	FIRE PLOT	
Section 4.3 Plot Level Data Collected in the Field		
Subsection 4.3.1 Crew Visit Information		
Item 4.3.1.1	SAMPLE METHOD CODE	
Item 4.3.1.2	QA STATUS	
Item 4.3.1.3	CREW TYPE	
Item 4.3.1.4	CREW NUMBER	
	CREW NUMBER	
	CREW NUMBER	
	CREW NUMBER	
	CREW NUMBER	
Subsection 4.3.2 Current Date of Inventory		
Item 4.3.2.1	YEAR	
Item 4.3.2.2	MONTH	
Item 4.3.2.3	DAY	
Subsection 4.3.3 Time Spent on Plot		
Item 4.3.3.1	TRAVEL TIME TO PLOT	
Item 4.3.3.2	MEASUREMENT TIME ON PLOT	
Item 4.3.3.3	TRAVEL TIME FROM PLOT	
Subsection 4.3.4 Plot Level Fundamentals		
Item 4.3.4.1	PLOT STATUS	

Item 4.3.4.2	PLOT NONSAMPLED REASON	
Item 4.3.4.3	NONFOREST SAMPLING STATUS	
Item 4.3.4.4	NONFOREST PLOT STATUS	
Item 4.3.4.5	NONFOREST PLOT NONSAMPLED REASON	
Item 4.3.4.6	SUBPLOTS EXAMINED	
Item 4.3.4.7	SAMPLE KIND	
Item 4.3.4.8	PREVPLOT MAPPING OR CONDITION ERROR	
Item 4.3.4.9	PREV PLOT NUMBER	
Subsection 4.3.5 Additional Items		
Item 4.3.5.1	TOPOGRAPHIC POSITION	
Item 4.3.5.2	HORIZONTAL DISTANCE TO IMPROVED ROAD	
Item 4.3.5.3	WATER ON PLOT	
Item 4.3.5.4	SURVEY GRADE GPS SUBPLOT ROVER FILES COLLECTED	
Item 4.3.5.5	PLOT NOTES	
Subsection 4.3.6 Sudden Oak Death Sample Collection		
Item 4.3.6.1	SOD SAMPLE COLLECTED	
Item 4.3.6.2	SOD PEST DETECTION REPORT NUMBER	
Item 4.3.6.3	SOD DISTANCE	
Item 4.3.6.4	SOD AZIMUTH	
Item 4.3.6.5	SOD PRESENT	
Item 4.3.6.6	SOD CONDITION CLASS NUMBER	
Subsection 4.3.7 Reference Point Attributes		
Item 4.3.7.1	RP TYPE	
Item 4.3.7.2	RP SPECIES	
Item 4.3.7.3	RP DIAMETER	
Item 4.3.7.4	RP AZIMUTH	
Item 4.3.7.5	RP HORIZONTAL DISTANCE	
Item 4.3.7.6	RP AZIMUTH/DISTANCE TO SUBPLOT NUMBER	
Item 4.3.7.7	RP NOTES	
Section 4.4 GPS Coordinates		
Subsection 4.4.3 GPS Unit Settings, Datum, and Coordinate System		
Item 4.4.3.1	GPS UNIT TYPE	
Item 4.4.3.2	GPS SERIAL NUMBER	
Item 4.4.3.3	GPS ENTRY METHOD	
Item 4.4.3.4	GPS DATUM	
Item 4.4.3.5	COORDINATE SYSTEM	
Item 4.4.3.6	GPS LOCATION TYPE	
Item 4.4.3.7	UTM ZONE	
Item 4.4.3.8	EASTING	
Item 4.4.3.9	NORTHING	
Item 4.4.3.10	GPS ELEVATION	
Item 4.4.3.11	GPS ERROR	
Item 4.4.3.12	NUMBER OF READINGS	
Item 4.4.3.13	GPS FILENAME	
Item 4.4.3.14	GPS NOTES	
Subsection 4.4.4 Correction for Offset Location		
Item 4.4.4.1	AZIMUTH TO PLOT CENTER	
Item 4.4.4.2	DISTANCE TO PLOT CENTER	

SUBSECTION T.1.2 CONDITION CLASS

Section 5.7 General Condition Class Attributes						
Item 5.7.0.1	CONDITION CLASS NUMBER					
Item 5.7.0.2	PREV CONDITION CLASS NUMBER					
Item 5.7.0.3	SUBPLOT CONDITION PROPORTION					
Item 5.7.0.4	CONDITION CLASS STATUS					
Item 5.7.0.5	PREV CONDITION CLASS STATUS					
Item 5.7.0.6	CONDITION CLASS STATUS RECONCILE CODE					
Item 5.7.0.7	CC STATUS PROCEDURAL CHANGE REASON CODE					
Item 5.7.0.8	FOREST LAND CONDITION STATUS CHANGE					
Item 5.7.0.9	NONFOREST CONDITION CLASS SAMPLING STATUS					
Item 5.7.0.10	NONFOREST CONDITION CLASS STATUS					
Item 5.7.0.11	NONFOREST CONDITION NONSAMPLED REASON					
Subsection 5.7.1 Accessible Forest Land Delineating Data Items						
Item 5.7.1.1	RESERVED STATUS					
Item 5.7.1.2	PREV RESERVED STATUS					
Item 5.7.1.3	RESERVED STATUS RECONCILE CODE					
Item 5.7.1.4	RESERVED STATUS PROCEDURAL CHANGE RSN CODE					
Item 5.7.1.5	OWNER GROUP					
Item 5.7.1.6	PREV OWNER GROUP					
Item 5.7.1.7	OWNER GROUP RECONCILE CODE					
Item 5.7.1.8	OWNER GROUP PROCEDURAL CHANGE REASON CODE					
Item 5.7.1.9	FOREST TYPE					
Item 5.7.1.10	PREV FOREST TYPE					
Item 5.7.1.11	STAND SIZE CLASS					
Item 5.7.1.12	PREV STAND SIZE CLASS					
Item 5.7.1.13	REGENERATION STATUS					
Item 5.7.1.14	PREV REGENERATION STATUS					
Item 5.7.1.15	TREE DENSITY					
Item 5.7.1.16	PREV TREE DENSITY					
Subsection 5.7.2 Ancillary						
Item 5.7.2.1	OWNER CLASS					
Item 5.7.2.2	PREV OWNER CLASS					
Item 5.7.2.3	RESERVED AREA NAME					
Item 5.7.2.4	ADMINISTRATIVE FOREST CODE					
Item 5.7.2.5	PREV ADMINISTRATIVE FOREST CODE					
Item 5.7.2.6	ARTIFICIAL REGENERATION SPECIES					
Item 5.7.2.7	PREV ARTIFICIAL REGENERATION SPECIES					
Item 5.7.2.8	AGE BASIS CODE					
Item 5.7.2.9	STAND AGE					
Item 5.7.2.10	PREV STAND AGE					
Item 5.7.2.11	PHYSIOGRAPHIC CLASS					
Item 5.7.2.12	PREV PHYSIOGRAPHIC CLASS					
Item 5.7.2.13	CURRENT GROUND LAND CLASS					
Item 5.7.2.14	PREV GROUND LAND CLASS					
Item 5.7.2.15	SOIL DEPTH					
Item 5.7.2.16	PREV SOIL DEPTH					
Item 5.7.2.17	CONDITION FUELBED TYPE					
Item 5.7.2.18	STAND STRUCTURE					
Item 5.7.2.19	PREV STAND STRUCTURE					

Item 5.7.2.20	DISTURBANCE 1					
Item 5.7.2.21	PREV DISTURBANCE 1					
Item 5.7.2.22	DISTURBANCE YEAR 1					
Item 5.7.2.23	PREV DISTURBANCE YEAR 1					
Item 5.7.2.24	DISTURBANCE 2					
Item 5.7.2.25	PREV DISTURBANCE 2					
Item 5.7.2.26	DISTURBANCE YEAR 2					
Item 5.7.2.27	PREV DISTURBANCE YEAR 2					
Item 5.7.2.28	DISTURBANCE 3					
Item 5.7.2.29	PREV DISTURBANCE 3					
Item 5.7.2.30	DISTURBANCE YEAR 3					
Item 5.7.2.31	PREV DISTURBANCE YEAR 3					
Item 5.7.2.32	HISTORICAL DISTURBANCE 1					
Item 5.7.2.33	PREV HISTORICAL DISTURBANCE 1					
Item 5.7.2.34	HISTORICAL DISTURBANCE YEAR 1					
Item 5.7.2.35	PREV HISTORICAL DISTURBANCE YEAR 1					
Item 5.7.2.36	HISTORICAL DISTURBANCE 2					
Item 5.7.2.37	PREV HISTORICAL DISTURBANCE 2					
Item 5.7.2.38	HISTORICAL DISTURBANCE YEAR 2					
Item 5.7.2.39	PREV HISTORICAL DISTURBANCE YEAR 2					
Item 5.7.2.40	HISTORICAL DISTURBANCE 3					
Item 5.7.2.41	PREV HISTORICAL DISTURBANCE 3					
Item 5.7.2.42	HISTORICAL DISTURBANCE YEAR 3					
Item 5.7.2.43	PREV HISTORICAL DISTURBANCE YEAR 3					
Item 5.7.2.44	TREATMENT 1					
Item 5.7.2.45	PREV TREATMENT 1					
Item 5.7.2.46	TREATMENT YEAR 1					
Item 5.7.2.47	PREV TREATMENT YEAR 1					
Item 5.7.2.48	TREATMENT 2					
Item 5.7.2.49	PREV TREATMENT 2					
Item 5.7.2.50	TREATMENT YEAR 2					
Item 5.7.2.51	PREV TREATMENT YEAR 2					
Item 5.7.2.52	TREATMENT 3					
Item 5.7.2.53	PREV TREATMENT 3					
Item 5.7.2.54	TREATMENT YEAR 3					
Item 5.7.2.55	PREV TREATMENT YEAR 3					
Item 5.7.2.56	HISTORICAL TREATMENT 1					
Item 5.7.2.57	PREV HISTORICAL TREATMENT 1					
Item 5.7.2.58	HISTORICAL TREATMENT YEAR 1					
Item 5.7.2.59	PREV HISTORICAL TREATMENT YEAR 1					
Item 5.7.2.60	HISTORICAL TREATMENT 2					
Item 5.7.2.61	PREV HISTORICAL TREATMENT 2					
Item 5.7.2.62	HISTORICAL TREATMENT YEAR 2					
Item 5.7.2.63	PREV HISTORICAL TREATMENT YEAR 2					
Item 5.7.2.64	HISTORICAL TREATMENT 3					
Item 5.7.2.65	PREV HISTORICAL TREATMENT 3					
Item 5.7.2.66	HISTORICAL TREATMENT YEAR 3					
Item 5.7.2.67	PREV HISTORICAL TREATMENT YEAR 3					
Item 5.7.2.68	SALVAGE VOLUME CLASS					
Item 5.7.2.69	CHAINING CODE					

Item 5.7.2.70	LAND COVER CLASS					
Item 5.7.2.71	PLANT ASSOCIATION					
Item 5.7.2.72	PLANT ASSOCIATION NONSAMPLED REASON					
Item 5.7.2.73	PLANT ASSOCIATION PUBLICATION					
Subsection 5.7.3 Determining Condition Classes on Nonforest Land						
Item 5.7.3.1	PRESENT NONFOREST LAND USE					
Item 5.7.3.2	PREV NONFOREST LAND USE					
Section 5.8 Determination of Crown Cover Values for Land Use Classification						
Subsection 5.8.1 Introduction						
Item 5.8.1.1	CANOPY COVER SAMPLE METHOD					
Item 5.8.1.2	LIVE CANOPY COVER					
Item 5.8.1.3	LIVE PLUS MISSING CANOPY COVER					
Item 5.8.1.4	CURRENT AFFORESTATION CODE					
Item 5.8.1.5	PREV AFFORESTATION CODE					
Item 5.8.1.6	TOTAL STEMS					
Item 5.8.1.7	STOCKING PERCENT					
Item 5.8.1.8	STOCKING MAXIMUM DBH/DRC					
Item 5.8.1.9	COVER PLOT NOTES					
Subsection 5.9 Nonsampled Condition Class Attributes						
Item 5.9.0.1	CONDITION NONSAMPLED REASON					
Item 5.9.0.2	PREV CONDITION NONSAMPLED REASON					
Item 5.9.0.3	NONSAMPLED FOREST TYPE					
Item 5.10.1.1	PREV CONDITION CLASS NOTES					
Item 5.10.1.2	CONDITION CLASS NOTES					
Item 5.10.1.3	CHANGE MATRIX NOTES					

SUBSECTION T.1.3 DETERMINATION OF CROWN COVER VALUES

Subsection 5.8.2 Cover Tree Data Items																								
Item 5.8.2.1	CVR SUBPLOT																							
Item 5.8.2.2	CONDITION CLASS NUMBER																							
Item 5.8.2.3	CVR TREE STATUS																							
Item 5.7.2.4	OVER TOPPED STATUS																							
Item 5.8.2.5	CVR TREE SPECIES																							
Item 5.8.2.6	CVR TREE DIAMETER																							
Subsection 5.8.3 Crown Measurements																								
Item 5.8.3.1	CVR TREE COMINGLED CROWN CODE																							
Item 5.8.3.2	CVR TREE LONG CROWN WIDTH																							
Item 5.8.3.3	CVR TREE SHORT CROWN WIDTH																							
Item 5.8.3.4	CVR TREE LONG CROWN WIDTH, NON-OVERTOPPED																							
Item 5.8.3.5	CVR TREE SHORT CROWN WIDTH, NON-OVERTOPPED																							
Item 5.8.3.6	CVR TREE STOCKING CONTRIBUTION																							
Item 5.8.3.7	CVR TREE CVR CONTRIBUTION																							
Item 5.8.3.8	CVR TREE NOTES																							

SUBSECTION T.1.4 SUBPLOT INFORMATION

Subsection 6.1.1 Subplot Information					
Item 6.1.1.1	SUBPLOT NUMBER	1	2	3	4
Item 6.1.1.2	PREV SUBPLOT MAPPING ERROR				
Item 6.1.1.3	SUBPLOT/MACROPLOT STATUS				
Item 6.1.1.4	SUBPLOT/MACROPLOT NONSAMPLED REASON				
Item 6.1.1.5	NONFOREST SUBPLOT/MACROPLOT STATUS				
Item 6.1.1.6	NONFOREST SUBPLOT/MACROPLOT NONSAMPLED RSN				
Item 6.1.1.7	PREV SUBPLOT/MACROPLOT CENTER CONDITION				
Item 6.1.1.8	SUBPLOT/MACROPLOT CENTER CONDITION				
Item 6.1.1.9	SUBPLOT/MACROPLOT CONDITION LIST				
Item 6.1.1.10	MICROPLOT CENTER CONDITION				
Item 6.1.1.11	PREV MICROPLOT CENTER CONDITION				
Item 6.1.1.12	P2 VEG SUBPLOT SAMPLE STATUS				
Item 6.1.1.13	VEG NONSAMPLED REASON				
Item 6.1.1.14	INVASIVE PLANT SUBPLOT SAMPLE STATUS				
Item 6.1.1.15	INVASIVE PLANT NONSAMPED REASON				
Item 6.1.1.16	SUBPLOT PIN FOUND				
Item 6.1.1.17	MICROPLOT PIN FOUND				
Subsection 6.1.3 Physiographic Class Information					
Item 6.1.3.1	MACROPLOT PHYSIOGRAPHIC CLASS				
Item 6.1.3.2	SUBPLOT SLOPE				
Item 6.1.3.3	SUBPLOT ASPECT				
Item 6.1.3.4	SNOW/WATER DEPTH				
Item 6.1.3.5	SUBPLOT/MACROPLOT NOTES				
Section 6.2 Root Disease Rating					
Subsection 6.2.2 Root Disease Data Items					
Item 6.2.2.1	ROOT DISEASE SEVERITY RATING				

SUBSECTION T.1.5 UNLISTED TREES

Subsection 6.1.2 Unlisted Trees				
SUBPLOT	GENUS	SPECIES	COUNT	NOTES

SUBSECTION T.1.6 BOUNDARY REFERENCES

Boundary #1					
Item 7.2.2.1	SUBPLOT NUMBER	1	2	3	4
Item 7.2.2.2	PLOT TYPE				
Item 7.2.2.3	PREV PLOT TYPE				
Item 7.2.2.4	BOUNDARY CHANGE				
Item 7.2.2.5	CONTRASTING CONDITION				
Item 7.2.2.6	PREV CONTRASTING COND				
Item 7.2.2.7	LEFT AZIMUTH				
Item 7.2.2.8	PREV LEFT AZIMUTH				
Item 7.2.2.9	CORNER AZIMUTH				
Item 7.2.2.10	PREV CORNER AZIMUTH				
Item 7.2.2.11	CORNER DISTANCE				
Item 7.2.2.12	PREV CORNER DISTANCE				
Item 7.2.2.13	RIGHT AZIMUTH				
Item 7.2.2.14	PREV RIGHT AZIMUTH				
Item 7.2.2.15	BOUNDARY NOTES				

Boundary #2					
Item 7.2.2.2	PLOT TYPE				
Item 7.2.2.3	PREV PLOT TYPE				
Item 7.2.2.4	BOUNDARY CHANGE				
Item 7.2.2.5	CONTRASTING CONDITION				
Item 7.2.2.6	PREV CONTRASTING COND				
Item 7.2.2.7	LEFT AZIMUTH				
Item 7.2.2.8	PREV LEFT AZIMUTH				
Item 7.2.2.9	CORNER AZIMUTH				
Item 7.2.2.10	PREV CORNER AZIMUTH				
Item 7.2.2.11	CORNER DISTANCE				
Item 7.2.2.12	PREV CORNER DISTANCE				
Item 7.2.2.13	RIGHT AZIMUTH				
Item 7.2.2.14	PREV RIGHT AZIMUTH				
Item 7.2.2.15	BOUNDARY NOTES				

Boundary #3					
Item 7.2.2.2	PLOT TYPE				
Item 7.2.2.3	PREV PLOT TYPE				
Item 7.2.2.4	BOUNDARY CHANGE				
Item 7.2.2.5	CONTRASTING CONDITION				
Item 7.2.2.6	PREV CONTRASTING COND				
Item 7.2.2.7	LEFT AZIMUTH				
Item 7.2.2.8	PREV LEFT AZIMUTH				
Item 7.2.2.9	CORNER AZIMUTH				
Item 7.2.2.10	PREV CORNER AZIMUTH				
Item 7.2.2.11	CORNER DISTANCE				
Item 7.2.2.12	PREV CORNER DISTANCE				
Item 7.2.2.13	RIGHT AZIMUTH				
Item 7.2.2.14	PREV RIGHT AZIMUTH				
Item 7.2.2.15	BOUNDARY NOTES				

Boundary #4					
Item 7.2.2.2	PLOT TYPE				
Item 7.2.2.3	PREV PLOT TYPE				
Item 7.2.2.4	BOUNDARY CHANGE				
Item 7.2.2.5	CONTRASTING CONDITION				
Item 7.2.2.6	PREV CONTRASTING COND				
Item 7.2.2.7	LEFT AZIMUTH				
Item 7.2.2.8	PREV LEFT AZIMUTH				
Item 7.2.2.9	CORNER AZIMUTH				
Item 7.2.2.10	PREV CORNER AZIMUTH				
Item 7.2.2.11	CORNER DISTANCE				
Item 7.2.2.12	PREV CORNER DISTANCE				
Item 7.2.2.13	RIGHT AZIMUTH				
Item 7.2.2.14	PREV RIGHT AZIMUTH				
Item 7.2.2.15	BOUNDARY NOTES				

SUBSECTION T.1.7 TREE AND SAPLING DATA

Item 8.5.1.1	SUBPLOT NUMBER													
Item 8.5.1.2	TREE RECORD NUMBER													
Item 8.5.1.3	TREE TAG NUMBER													
Item 8.5.1.4	PREV TREE TAG NUMBER													
Item 8.5.1.5	CONDITION CLASS NUMBER													
Item 8.5.1.6	PREV CONDITION CLASS NUMBER													
Item 8.5.1.7	PREV TREE STATUS													
Item 8.5.1.8	PRESENT TREE STATUS													
Item 8.5.1.9	SUBPLOT TALLY TREE WITNESS													
Item 8.5.1.10	STANDING DEAD													
Item 8.5.1.11	RECONCILE													
Item 8.5.1.12	SPECIES													
Item 8.5.1.13	AZIMUTH													
Item 8.5.1.14	HORIZONTAL DISTANCE													
Item 8.5.1.15	SLOPE DIST TO WITNESS TREE OR OBJECT													
Subsection 8.6.3 Diameter at Breast Height														
Item 8.6.4.1	PREV DIAMETER AT BREAST HEIGHT													
Item 8.6.4.2	DIAMETER AT BREAST HEIGHT													
Subsection 8.6.4 Diameter at Root Collar														
Item 8.6.5.1	PREV DIAMETER AT ROOT COLLAR													
Item 8.6.5.2	DRC STEM DIAMETER													
Item 8.6.5.3	DRC STEM STATUS													
Item 8.6.5.4	PAST NUMBER OF STEMS													
Item 8.6.5.5	CURRENT NUMBER OF STEMS													
Subsection 8.6.5 Additional Diameter Data Items														
Item 8.6.6.1	DIAMETER CHECK													
Item 8.6.6.2	LENGTH TO DIAMETER MEAS POINT													
Subsection 8.7.1 Tree Age														
Item 8.7.1.1	TREE AGE													
Item 8.7.1.2	TREE AGE METHOD													
Item 8.7.1.3	NUMBER OF RINGS													
Item 8.7.1.4	NUMBER OF RINGS IN INNER 2 INCHES													
Item 8.7.1.5	LENGTH OF MEASURED CORE													
Item 8.7.1.6	10-YEAR INCREMENT													
Item 8.7.1.7	5-YEAR INCREMENT													
Item 8.7.1.8	5-YEAR HEIGHT GROWTH													
Subsection 8.7.2 Tree Length														
Item 8.7.2.1	GROWTH SAMPLE TREE													
Item 8.7.2.2	PREV ACTUAL LENGTH													
Item 8.7.2.3	ACTUAL LENGTH													
Item 8.7.2.4	PREV TOTAL LENGTH													
Item 8.7.2.5	TOTAL LENGTH													
Item 8.7.2.6	LENGTH METHOD													
Item 8.7.2.7	PREV LENGTH METHOD													
Subsection 8.7.3 Tree Live Crown Measurements														
Item 8.7.3.1	COMPACTED CROWN RATIO													
Item 8.7.3.2	CROWN CLASS													
Subsection 8.8 Tree Damage														
Item 8.8.0.1	DAMAGE AGENT 1													

Item 8.8.0.2	DAMAGE AGENT 2													
Item 8.8.0.3	DAMAGE AGENT 3													
Item 8.8.0.4	DWARF MISTLETOE CLASS													
Item 8.8.0.5	ROTTEN/MISSING CULL													
Item 8.8.0.6	ROUGH CULL													
Subsection 8.9.1 Live Tree Measured Data Items														
Item 8.9.1.1	CAVITY PRESENCE													
Item 8.9.1.2	REMNANT TREE													
Item 8.9.1.3	FORM CLASS													
Subsection 8.9.2 Standing Dead or Removed														
Item 8.9.2.1	CAUSE OF DEATH													
Item 8.9.2.2	MORTALITY YEAR													
Item 8.9.2.3	DECAY CLASS													
Item 8.9.2.4	SNAG REASON FOR DISAPPEARANCE													
Item 8.9.2.5	CULTURALLY KILLED													
Item 8.10.1.1	TREE NOTES													

SUBSECTION T.1.8 DRC STEM DIAMETER

[Record each live stem with an “L” (DRC STEM STATUS=0), and each dead stem with a “D” (DRC STEM STATUS=1).]																				
Subplot #																				
Tree #																				
Current # of Stems																				
Dia 1																				
Dia 2																				
Dia 3																				
Dia 4																				
Dia 5																				
Dia 6																				
Dia 7																				
Dia 8																				
Dia 9																				
Dia 10																				
Dia 11																				
Dia 12																				
Dia 13																				
Dia 14																				
Dia 15																				
Dia 16																				
Dia 17																				
Dia 18																				
Dia 19																				
Dia 20																				
DRC																				

$$DRC = \sqrt{[\Sigma(Diameter^2)]}$$

$$DRC = \sqrt{[Diameter^2 + Diameter^2 + Diameter^2]}$$

SUBSECTION T.1.9 SEEDLING DATA

Species	CC #	Subplot 1 Seedling count	CC #	Subplot 2 Seedling Count	CC #	Subplot 3 Seedling Count	CC #	Subplot 4 Seedling Count
Seedling Notes:								

SUBSECTION T.1.10 SITE TREE INFORMATION

Item 10.5.1.1	SITE TREE NUMBER										
Item 10.5.1.2	SUBPLOT NUMBER										
Item 10.5.1.3	SITE TREE STATUS										
Item 10.5.1.4	QUESTIONABLE SITE TREE FLAG										
Item 10.5.1.5	CONDITION CLASS LIST										
Item 10.5.1.6	TREE TAG NUMBER										
Item 10.5.1.7	AZIMUTH										
Item 10.5.1.8	HORIZONTAL DISTANCE										
Item 10.5.1.9	SPECIES										
Item 10.5.1.10	DIAMETER										
Item 10.5.1.11	SITE TREE LENGTH										
Item 10.5.1.12	TREE AGE AT DIAMETER										
Item 10.5.1.13	SITE TREE SELECTION METHOD										

SUBSECTION T.1.11 DWM TRANSECT LINE SEGMENTING

Plot Number:			Date:				
Subplot Number	Transect (Azimuth)	Segment Number	Condition Class #	Beginning Distance	Ending Distance	SEGMENT SAMPLE STATUS	SEGEMENT NONSAMPLED REASON
1	90	.	.	. . . .	. . . .		
	90	.	.	. . . .	. . . .		
	90	.	.	. . . .	. . . .		
	90	.	.	. . . .	. . . .		
1	270	.	.	. . . .	. . . .		
	270	.	.	. . . .	. . . .		
	270	.	.	. . . .	. . . .		
	270	.	.	. . . .	. . . .		
2	360	.	.	. . . .	. . . .		
	360	.	.	. . . .	. . . .		
	360	.	.	. . . .	. . . .		
	360	.	.	. . . .	. . . .		
2	180	.		. . . .	. . . .		
	180	.		. . . .	. . . .		
	180	.		. . . .	. . . .		
	180	.		. . . .	. . . .		
3	135	.	.	. . . .	. . . .		
	135	.	.	. . . .	. . . .		
	135	.	.	. . . .	. . . .		
	135	.	.	. . . .	. . . .		
3	315	.	.	. . . .	. . . .		
	315	.	.	. . . .	. . . .		
	315	.	.	. . . .	. . . .		
	315	.	.	. . . .	. . . .		
4	045	.	.	. . . .	. . . .		
	045	.	.	. . . .	. . . .		
	045	.	.	. . . .	. . . .		
	045	.	.	. . . .	. . . .		
4	225	.	.	. . . .	. . . .		
	225	.	.	. . . .	. . . .		
	225	.	.	. . . .	. . . .		
	225	.	.	. . . .	. . . .		

SUBSECTION T.1.12 COARSE WOODY DEBRIS

Item 11.6.3.1	SUBPLOT NUMBER																			
Item 11.6.3.2	COARSE WOODY DEBRIS ID																			
Item 11.6.3.3	TRANSECT																			
Item 11.6.3.4	CWD CONDITION CLASS																			
Item 11.6.3.5	PIECE ON SUBPL/ANN PLOT																			
Item 11.6.3.6	CWD SLOPE DISTANCE																			
Item 11.6.3.7	CWD DECAY CLASS																			
Item 11.6.3.8	SPECIES																			
Item 11.6.4.1	DIAM AT POINT OF INT																			
Item 11.6.4.2	DIAM AT HOLLOW PT OF INT																			
Item 11.6.5.1	CWD LENGTH ≥3 FEET																			
Item 11.6.5.2	IS THE PIECE HOLLOW																			
Item 11.6.5.3	PIECE INCLINATION																			
Item 11.6.5.4	CWD HISTORY																			
Item 11.6.5.5	% CHARRED BY FIRE																			
Item 11.6.5.6	NOTES																			

SUBSECTION T.1.13 FINE WOODY DEBRIS

Item 11.8.0.1	SUBPLOT NUMBER	1	2	3	4
Item 11.8.0.2	TRANSECT	270	360	135	225
Item 11.8.0.3	COND CLASS NUMBER				
Item 11.8.0.4	TRANSECT SAMPLE STATUS				
Item 11.8.0.5	TRANSECT NONSAMP REASN				
Item 11.8.0.6	SMALL FWD COUNT				
Item 11.8.0.7	MEDIUM FWD COUNT				
Item 11.8.0.8	LARGE FWD COUNT				
Item 11.8.0.9	HIGH COUNT REASON				
Item 11.8.0.10	FINE WOODY DEBRIS NOTES				

SUBSECTION T.1.14 DUFF AND LITTER DEPTH MEASUREMENTS

Item 11.9.2.1	SUBPLOT NUMBER	1	1	2	2	3	3	4	4
Item 11.9.2.2	TRANSECT	90	270	360	180	135	315	45	225
Item 11.9.2.3	COND CLASS NUMBER								
Item 11.9.2.4	DUFF/LITTER SAMP STATUS								
Item 11.9.2.5	DUFF/LITTER NONSAMP RSN								
Item 11.9.2.6	DUFF DEPTH								
Item 11.9.2.7	LITTER DEPTH								
Item 11.9.2.8	DUFF AND LITTER METHOD								
Item 11.9.2.9	DUFF AND LITTER NOTES								

SUBSECTION T.1.15 RESIDUE PILES

Item 11.7.0.1	SUBPLOT NUMBER								
Item 11.7.0.2	PILE NUMBER								
Item 11.7.0.3	PILE TRANSECT								
Item 11.7.0.4	PILE COND CLASS NUMBER								
Item 11.7.0.5	PILE BEGINNING DISTANCE								
Item 11.7.0.6	PILE ENDING DISTANCE								
Item 11.7.0.7	PILE COMP HGT OF CWD IN PILE								
Item 11.7.0.8	PILE DECAY CLASS								
Item 11.7.0.9	PILE SPECIES								
Item 11.7.0.10	RESIDUE PILE NOTES								

SUBSECTION T.1.16 VEGETATION SPECIES COMPOSITION

Subplot 1	Condition Class 1	SPECIES CODE														
		UNIQUE Sp NUMBER														
		Sp CODE TYPE														
		Sp CODE STATUS														
		Sp OFFIC. COLLECTED														
		Sp NOT COLLECTED RSN														
		Sp LABEL NUMBER														
		Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
		VEGETATION Sp NOTES														
	CC2	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC3	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC4	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC5	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
Subplot 2	CC1	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC2	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC3	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC4	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC5	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
Subplot 3	CC1	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC2	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC3	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC4	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC5	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
Subplot 4	CC1	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC2	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC3	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC4	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														
	CC5	Sp GROWTH HABIT														
		Sp VEGETATION LAYER														
		Sp CANOPY COVER														

SUBSECTION T.1.17 VEGETATION STRUCTURE

SUBPLOT	1					2					3					4				
CONDITION CLASS NUMBER	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
TALLY TREE SP COVER LAYER 1																				
TALLY TREE SP COVER LAYER 2																				
TALLY TREE SP COVER LAYER 3																				
TALLY TREE SP COVER LAYER 4																				
TALLY TREE SP COVER-AERIAL VIEW																				
NON-TALLY TREE SP COVER LAYER 1																				
NON-TALLY TREE SP COVER LAYER 2																				
NON-TALLY TREE SP COVER LAYER 3																				
NON-TALLY TREE SP COVER LAYER 4																				
NON-TALLY TREE SP COVER-AERIAL VIEW																				
SHRUB AND WOODY VINE COVER LAYER 1																				
SHRUB AND WOODY VINE COVER LAYER 2																				
SHRUB AND WOODY VINE COVER LAYER 3																				
SHRUB AND WOODY VINE COVER LAYER 4																				
SHRUB AND WOODY VINE COVER-AERIAL VIEW																				
FORB COVER LAYER 1																				
FORB COVER LAYER 2																				
FORB COVER LAYER 3																				
FORB COVER LAYER 4																				
FORB COVER—AERIAL VIEW																				
GRAMINOID COVER LAYER 1																				
GRAMINOID COVER LAYER 2																				
GRAMINOID COVER LAYER 3																				
GRAMINOID COVER LAYER 4																				
GRAMINOID COVER-AERIAL VIEW																				
VEGETATION SUBPLOT NOTES																				

SUBSECTION T.1.18 INDICATOR SPECIES ON R6 LAND AND BLM LANDS

Item 13.0.0.1	SUBPLOT NUMBER											
Item 13.0.0.2	SPECIES											
Item 13.0.0.3	SPECIES CANOPY COVER											

SECTION T.2 PLOT CARD

PLOT CARD

PLOT NUMBER _______ STATE ____________ (   ) COUNTY _________________ (   ) DATE ____/____/____

CREW LEADER _________________________ CREW ____

Directions to plot, plot narrative and RP information are in the electronic data file

Hazards or Safety Concerns: ____

____

____

Access Notes (e.g. Key/combo needed? Permit req'd? Backpacker?)**:** ___________________________

____

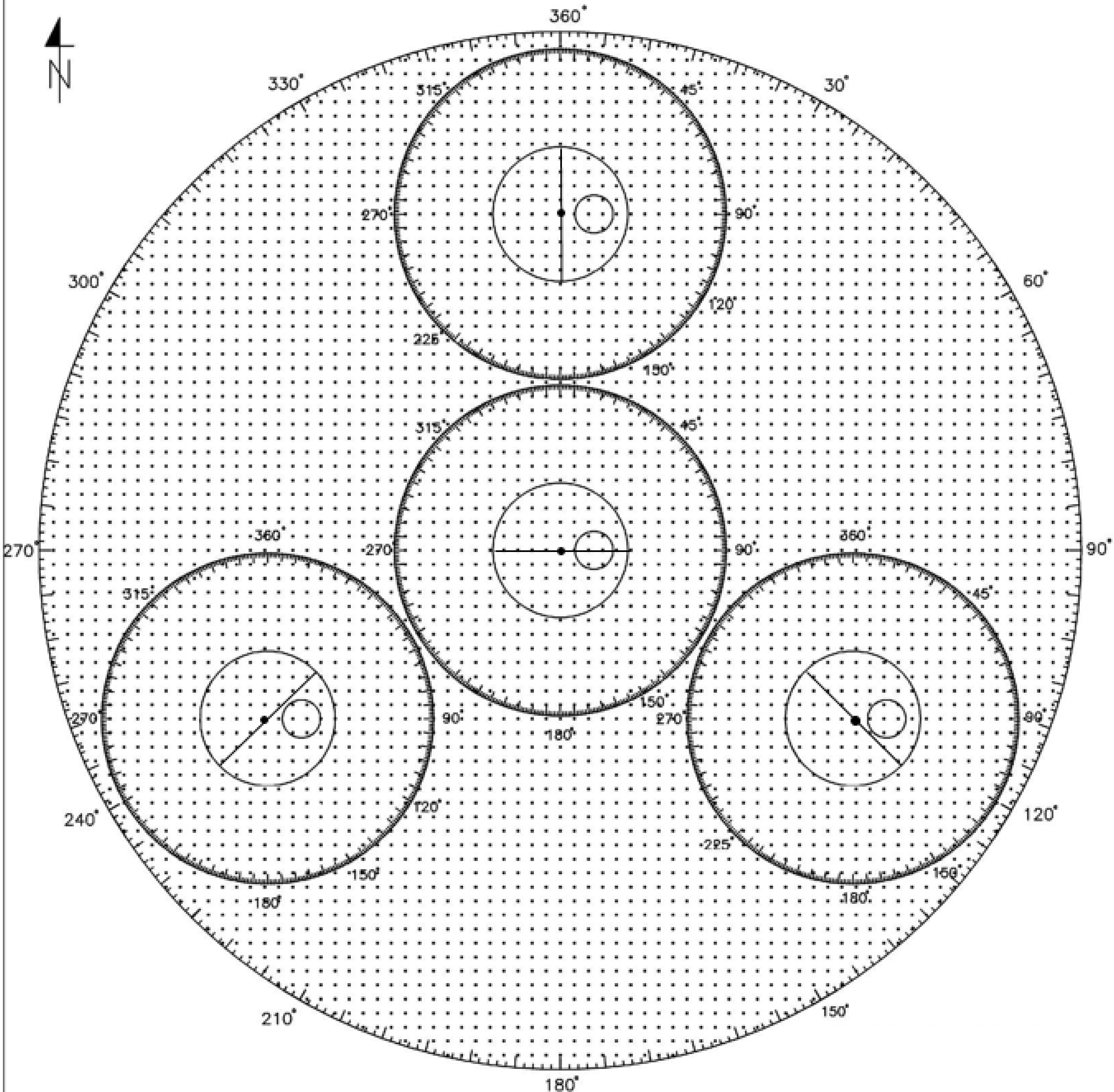
____

Plot Access: location sketch map (map is required if one of the situations listed in Subsection R.6.4 exists)

N

STATE ______ PLOT NUMBER __________

MAPPING



SCALE: 1 inch = 50 feet			
Dot interval = 5.0 feet (use 50 scale on ruler)			
TO CALCULATE % AREA			
PLOT RADIUS (FT)	TOTAL DOTS	%/DOT	%AREA =
24.0	69	1.45	#DOTS + 69
58.9	437	0.23	#DOTS + 4.37
185.1	4281	0.02	#DOTS + 2.81

2018

APPENDIX U IMPORTANT PHONE NUMBERS

SECTION U.1 PNW - FIA

	Name	Office	Mobile
AMT			
	PFSL Front Desk	503-808-2000	
	Fax	503-808-3232	
Data Collection (DC)			
	Stanton, Sharon - FIA Program Manager	503-808-2019	
	Nesmith, Jonathan - Data Collection Team Leader		503-708-8422
	Patterson, Melissa - Prefield Coordinator	503-808-2073	
	Jackson, Danielle - Prefield	503-808-3130	971-261-3220
	Cossey, Janelle - Gear/Fleet/Safety	503-808-2007	503-539-8831
	Deans, Jess - QA Coordinator		503-539-3993
	Durfee, Dan - Oregon State Coordinator	503-808-2076	971-334-4029
	Rigsby, Katie - Washington State Coordinator	503-808-3131	916-261-4080
	Gerdes, Michelle - California State Coordinator	503-808-2191	503-708-8416
	Foss, Walter - CalFire Project Coordinator		559-514-5356
	Hoff, Hannah - Assistant Coordinator, Travel, Purchasing		541-324-0639
Information Management (IM)			
	Rash, Scott - IT Specialist	503-808-2081	
	Veneklase, Chuck - Data Recorder Programmer	503-808-2045	541-841-3237
Data Collection QA			
	Carson, Johnny		503-704-9747
	Coles, Daniel	503-808-2078	503-539-9079
	Kraft, Steve		909-501-8064
	Lewis, Brian		916-201-4076
	Zimmerman, Graham		530-802-6947
	Hoff, Andy		541-805-1145
Human Resources (HR)			
	Albuquerque Service Center	877-372-7248	
	http://fsweb.asc.fs.fed.us		
Vehicle Contacts			
	GSA Maintenance Center (all GSA repairs/service)	866-400-0411	
After hours field crew emergencies/On Call Coordinator		503-808-3126	
Customer Help Desk – Computer Assistance (24 Hour)		866-945-1354	
PNW-FIA Office Address			
	Portland Forestry Sciences Lab 1220 SW 3rd Ave, Suite 1410 Portland, OR 97204-9763		
Region 6 National Forest System (NFS) Contract Inspectors/Contracting Officers Representives (COR)			
	Morefield, Brance - Region 6	503-808-2676	541-399-2078
	Hayden, Heather - Region 6	503-808-2911	503-367-9400

SECTION U.2 REGIONAL INSECT AND DISEASE CONTACTS

Name		Office	Extra Info	FAX
Insects/Disease Contacts				
	Angwin, Paul – Entomologist (CA, Shasta-Trinity NF)	530-242-2336		
	Bohne, Michael – Entomologist (R5)	530-759-1745		
	Bulaon, Beverly – Entomologist (CA, Stanislaus NF)	209-532-3671	x242	
	Flowers, Rob – Entomologist (OR Dept of Forestry)	503-945-7396		
	Kanaskie, Alan – Pathologist (OR Dept of Forestry)	503-945-7397		
	Koonce, Andi – Pathologist (CA, San Bernardino NF)	909-382-2673		
	MacKenzie, Martin – Pathologist (CA, Stanislaus NF)	209-532-3671	x242	
	Omdal, Dan – Pathologist (WA DNR-Oympia)	360-902-1692		
	Ripley, Karen – Entomologist (WA DNR-Olympia)	360-902-1691		
	Smith, Sheri – Entomologist (CA, Lassen NF)	530-252-6667		
	Woodruff, Bill – Pathologist (CA, Lassen NF)	530-252-6680		
	Zambino, Paul – Pathologist (CA, San Bernardino NF)	909-382-2727		
R6 Forest Health Protection Staff		http://www.fs.fed.us/r6/nr/fid/staffweb/field.shtml		
	Blue Mountains Service Center (LaGrande, OR): Forestry Sciences Laboratory 1401 Gekeler Lane La Grande, OR 97850			FAX: 541-962-6504
	Schmitt, Craig – Plant Pathologist	541-962-6544	clschmitt@fs.fed.us	
	Scott, Donald W.– Entomologist	541-962-6545	dwscott@fs.fed.us	
	Spiegel, Lia – Entomologist	541-962-6574	lspiegel@fs.fed.us	
	Central Oregon Service Center (Bend, OR): Deschutes National Forest 1001 SW Emkay Drive Bend, OR 97702			FAX: 541-383-5531
	Eglitis, Andris – Entomologist	541-383-5701	aeglitis@fs.fed.us	
	Maffei, Helen – Plant Pathologist	541-383-5591	hmaffei@fs.fed.us	
	Simpson, Mike – Silviculturist/Analyst {available part-time to FHP}	541-383-5575	mlsimpson@fs.fed.us	
	Smith, Aaron L. – Plant Pathologist (SCEP)	541-383-5771	alsmith@fs.fed.us	
	Southwest Oregon Service Center (Central Point, OR): Herbert Stone Nursery 2606 Old Stage Road Central Point, OR 97529			FAX: 541-858-6110
	Betlejewski, Frank – Port-Orford-cedar Program Manager	541-858-6127	fbetlejewski@fs.fed.us	
	Goheen, Don – Pathologist/Entomologist	541-858-6125	dgoheen@fs.fed.us	
	Goheen, Ellen Michaels – Pathologist	541-858-6126	egoheen@fs.fed.us	
	Mallams, Katy – Pathologist	541-858-6124	kmallams@fs.fed.us	
	Schroeter, Bob – Aerial Observer	541-858-6123	rschroeter@fs.fed.us	
	Wenatchee Service Center (Wenatchee, WA): Forestry Sciences Laboratory 1133 N. Western Wenatchee, WA 98801			FAX: 509-826-3789
	Carlson, Darci M. – Entomologist (SCEP)	509-664-1745	dmcarlson@fs.fed.us	
	Hadfield, James S. – Plant Pathologist	509-664-9215	jshadfield@fs.fed.us	
	Magelssen, Roy W. – Biological Science Technician	509-664-9214	rmagelssen@fs.fed.us	
	Mehmel, Connie J. – Entomologist	509-664-9213	cmehmel@fs.fed.us	
	Saavedra, Angel – Plant Pathologist	509-664-9223	alsaavedra@fs.fed.us	
	Westside Service Center (Sandy, OR): Mount Hood National Forest 16400 Champion Way Sandy, OR 97055			FAX: 503-668-1423
	Chadwick, Kristen – Plant Pathologist	503-668-1474	klchadwick@fs.fed.us	
	Hildebrand, Diane M. – Plant Pathologist	503-668-1474	dhildebrand@fs.fed.us	
	Hostetler, Bruce B. – Entomologist	503-668-1475	bhostetler@fs.fed.us	
	Smith, Ben – Aerial Observer	503-668-1761	bsmith02@fs.fed.us	
	Sprengel, Keith – Forestry Technician	503-668-1476	ksprengel@fs.fed.us	
	Willhite, Beth – Entomologist	503-668-1477	bwillhite@fs.fed.us	
Region 5 NFS/Remote Sensing Lab Contacts				
	Marshall, Jack (CDF Pathologist) - Willits, CA	707-459-7448		
	Owen, Don (CDF Entomologist) - Redding, CA	530-224-2494		
	Smith, Tom (CDF Pathologist) - Davis, CA	530-758-0306	tom.smith@fire.ca.gov	

SECTION U.3 24-HOUR EMERGENCY SHERIFF DISPATCH NUMBERS

SUBSECTION U.3.1 CALIFORNIA

County	Sheriff Name	24-hour Phone	Website	Alternate Phone
Alameda	Yesenia Sanchez	510-667-7721	http://www.alamedacountysheriff.org	510-268-7905
Alpine	Tom Minder	619-694-2231	http://www.alpinecountyca.gov/index.aspx?NID=204	530-694-2231
Amador	Gary Redman	209-223-6500	https://www.amadorsheriff.org/	209-223-6513
Butte	Kory Honea	530-538-7321	http://www.buttecounty.net/sheriffcoroner	530-538-7471
Calaveras	Rick DiBasilio	209-754-6500	https://sheriff.calaverasgov.us/	209-754-6499
Colusa	Joe Garofalo	530-458-0200	http://www.colusasheriff.com	530-458-0208
Contra Costa	David Livingston	925-646-2441	https://www.cocosheriff.org/	925-655-0000
Del Norte	Garrett Scott	707-464-4191	http://www.co.del-norte.ca.us/departments/sheriff-department	
El Dorado	Jeff Leikauf	530-626-4911	http://www.edcgov.us/sheriff	530-621-5655
Fresno	John Zanoni	559-600-3111	https://www.fresnosheriff.org/	
Glenn	Justin Gibbs	530-934-6431	http://www.countyofglenn.net/dept/sheriff	530-934-6441
Humboldt	William Honsal	707-445-7251	https://humboldtgov.org/2545/Sheriffs-Office	
Imperial	Fred Miramontes	442-465-2021	http://www.icso.org	1-800-452-2051
Inyo	Stephanie J. Rennie	760-878-0383	https://www.inyocounty.us/services/sheriff	
Kern	Donny Youngblood	661-861-3110	http://www.kernsheriff.com	661-391-7500
Kings	David Robinson	559-852-2720	http://www.countyofkings.com/departments/public-safety/sheriff	559-584-1431
Lake	Rob Howe	707-263-2690	http://www.lakesheriff.com	707-262-4200
Lassen	Dean Growdon	530-257-6121	http://www.lassencounty.org/dept/sheriffs-office/sheriffs-office	530-251-8013
Los Angeles	Robert G. Luna	213-229-1700	https://lasd.org/	
Los Angeles	Jabari Williams*	626-798-1131	www.Altadena.lasd.org	
Los Angeles	John Lecrivian*	661-948-8466	https://lasd.org/lancaster/	
Madera	Tyson Pogue	559-675-7770	http://www.madera-county.com/sheriff	
Marin	Robert T. Doyle	415-479-2311	http://www.marinsheriff.org	415-473-7250
Mariposa	Jeremy Briese	209-966-3615	http://www.mariposacounty.org/sheriff	
Mendocino	Matthew Kendall	707-463-4086	http://www.mendocinosheriff.com	707-463-4411
Merced	Vernon Warnke	209-385-7444	http://www.co.merced.ca.us/sheriff	209-385-7434
Modoc	William “Tex” Dowdy	530-233-4416	http://www.modocsheriff.us	
Mono	Ingrid Braun	760-932-7549	http://www.monosheriff.org	760-935-4066
Monterey	Tina Nieto	831-647-7911	http://www.co.monterey.ca.us/sheriff	831-755-3700
Napa	Oscar Ortiz	707-253-0911	http://www.countyofnapa.org/sheriff	707-253-4509
Nevada	Shannon Moon	530-265-1471	https://www.mynevadacounty.com/150/Sheriff-Coroner-Public-Administrator	
Orange	Don Barnes	714-834-6683	http://www.ocsd.org	714-647-7000
Placer	Wayne Woo	530-886-5375	http://www.placer.ca.gov/sheriff	530-889-7800
Plumas	Todd Johns	530-283-6300	http://www.countyofplumas.com/index.aspx?nid=587	530-283-6375
Riverside	Chad Bianco	760-836-3215	http://www.riversidesheriff.org	951-955-2400
Sacramento	Cooper James	916-874-5115	http://www.sacsheriff.com	
San Benito	Eric Taylor	831-636-4080	https://www.cosb.us/departments/sheriff-s-office	831-636-4000
San Bernardino	Shannon Dicus	909-387-8313	https://wp.sbcounty.gov/sheriff/	760-956-5001
San Diego	Kelly A. Martinez	858-565-5200	http://www.sdsheriff.net	858-974-2222
San Francisco	Paul Miyamoto	415-553-0123	http://www.sfsheriff.com	415-554-7225
San Joaquin	Patrick Withrow	209-468-4400	https://sjsheriff.org/	209-468-4562
San Luis Obispo	Ian Parkinson	805-781-4550	http://www.slosheriff.org	805-781-4550
San Mateo	Christina Corpus	650-363-4911	http://www.smcsheriff.com	

County	Sheriff Name	24-hour Phone	Website	Alternate Phone
Santa Barbara	Bill Brown	805-683-2724	http://www.sbsheriff.org	805- 681-4100
Santa Clara	Bob Jonsen	408-299-2311	http://www.sccsheriff.org	408-808-4400
Santa Cruz	Jim Hart	831-471-1131	http://www.scsheriff.com	831-454-7618
Shasta	Michael L. Johnson	530-245-6650	https://www.shastacounty.gov/sheriff	530-245-6540
Sierra	Micheal Fisher	530-289-3700	http://www.sierracounty.ca.gov/298/Sheriff-Coroner	530- 993-4479
Siskiyou	Jeremiah LaRue	530-841-2900	https://www.co.siskiyou.ca.us/sheriff	530-842-8300
Solano	Tom Ferrara	707-784-7090	https://www.solanocounty.com/depts/sheriff/default.asp	707-784-7000
Sonoma	Mark Essick	707-565-2121	http://www.sonomasheriff.org	707-565-2511
Stanislaus	Jeff Dirkse	209-552-2468	https://www.scsdonline.com/	209-525-5630
Sutter	Brandon Barnes	530-822-7307	https://suttersheriff.org/	
Tehama	Dave Kain	530-529-7900	http://www.tehamaso.org	
Trinity	Timothy Saxon	530-623-2611	https://www.trinitycounty.org/Sheriff-Department	530-623-8124
Tulare	Mike Boudreaux	559-733-6218	https://tularecounty.ca.gov/sheriff/	559-802-9400
Tuolumne	Bill Pooley	209-533-5815	https://www.tuolumnecounty.ca.gov/341/Sheriffs-Office	209-533-5855
Ventura	Jim Fryhoff	805-654-9511	https://www.venturasheriff.org/	805-654-2380
Yolo	Tom Lopez	530-666-6612	http://www.yolocountysheriff.com	530-666-8282
Yuba	Wendell Anderson	530-749-7777	http://sheriff.co.yuba.ca.us/	

SUBSECTION U.3.2 OREGON

County	Sheriff Name	24-hour Phone	Website	Alternate Phone
Baker	Travis Ash	541-523-6415	http://www.bakersheriff.org/	
Benton	Jef Van Arsdall	541-766-6858	http://www.co.benton.or.us/sheriff/	
Clackamas	Angela Brandenburg	503-655-8211	http://www.clackamas.us/sheriff/	503-785-5000
Clatsop	Matthew D. Phillips	503-325-2061	https://www.co.clatsop.or.us/sheriff	503-325-8635
Columbia	Brian Pixley	503-397-1521	https://sheriff.columbiacountyor.gov/	503-366-4611
Coos	Gabe Fabrizio	541-396-2106 or 7830	http://www.co.coos.or.us/Departments/SheriffsOffice.aspx	541-396-7800
Crook	John Gautney	541-447-6398	https://co.crook.or.us/sheriff	
Curry	John Ward	541-247-3242	https://www.co.curry.or.us/government/county_sheriff/index.php	541-247-3243
Deschutes	L. Shane Nelson	541-693-6911	http://sheriff.deschutes.org/	541-388-6655
Douglas	John Hanlin	541-440-4471	http://www.dcso.com/	541-440-4450
Gilliam	Gary Bettencourt	541-384-2080	http://www.co.gilliam.or.us/government/sheriff_s_office/index.php	541-351-9530
Grant	Todd McKinley	541-575-1131	https://grantcountyoregon.net/262/Sheriffs-Office	
Harney	Daniel Jenkins	541-573-6156	https://www.co.harney.or.us/index.php/features/sheriff-s-office	
Hood River	Matt English	541-386-2711	http://www.hoodriversheriff.com/	541-386-2098
Jackson	Nate Sickler	541-776-7206 or 7207	http://jacksoncountyor.org/sheriff	541-774-6800
Jefferson	Jason Pollock	541-475-2201	http://www.co.jefferson.or.us/sheriff	541-475-6520
Josephine	Dave Daniel	541-474-5123	https://www.josephinecounty.gov/government/sheriff/index.php	541-474-5109 x 3120
Klamath	Chris Kaber	541-883-5130	http://sheriff.klamathcounty.org/	
Lake	Michael Taylor	541-947-2504	http://www.lakecountyor.org/government/sheriff.php	541-947-6027
Lane	Clifton Harrod	541-682-4150	https://www.lanecounty.org/government/county_departments/sheriff_s_office	541-682-4434
Lincoln	Curtis Landers	541-265-0777	http://www.co.lincoln.or.us/sheriff	541-265-4277
Linn	Michelle Duncan	541-967-3950	http://www.linnsheriff.org/	
Malheur	Brain Wolfe	541-473-5125	https://sheriff.malheurco.org/	541-473-5126
Marion	Joe Kast	503-588-5032	http://www.co.marion.or.us/so/	503-588-5094
Morrow	John A. Bowles	541-676-5317	https://www.co.morrow.or.us/sheriff	541-676-5317
Multnomah	Nicole Morrisey O'Donnell	503-988-4300	https://mcso.us/site/	
Polk	Mark Garton	503-623-9251	http://www.co.polk.or.us/sheriff	
Sherman	Brad Lohrey	541-384-2080	http://www.co.sherman.or.us/govt_sheriff.asp	541-565-3622
Tillamook	Joshua Brown	503-815-1911	https://www.tillamooksheriff.com/	503-842-2561
Umatilla	Terry Rowan	541-966-3651	https://www.co.umatilla.or.us/sheriff/	541-966-3600
Union	Cody Bowen	541-963-1017	http://unioncountysheriff.us/	
Wallowa	Joel Fish	541-426-3131	https://co.wallowa.or.us/public-safety/sheriff/	
Wasco	Lane Magill	541-296-5454	https://www.co.wasco.or.us/departments/sheriff/index.php	541-506-2580
Washington	Patrick Garrett	503-629-0111	http://www.co.washington.or.us/sheriff/	503-846-2700
Wheeler	Mike Smith	541-384-2080	http://www.wheelercountyoregon.com/sheriffs-office	541-763-4101
Yamhill	Tim Svenson	503-434-6500	https://www.co.yamhill.or.us/sheriff	503-434-7506

SUBSECTION U.3.3 WASHINGTON

County	Sheriff Name	24-hour Phone	Website	Alternate Phone
Adams	Dale Wagner	509-659-1122	https://www.co.adams.wa.us/government/sheriff/index.php	
Asotin	John Hilderbrand	509-758-2331	https://www.co.asotin.wa.us/228/Sheriff	509-243-4717
Benton	Tom Croskrey	509-628-0333	http://www.co.benton.wa.us/pview.aspx?id=714&catID=45	509-735-6555
Chelan	Mike Morrison	509-667-6851	http://www.co.chelan.wa.us/sheriff	
Clallam	Brian King	360-417-2459	http://www.clallam.net/Sheriff/	360-417-2262
Clark	John Horch	360-397-2211	https://www.clark.wa.gov/sheriff	360-397-2211
Columbia	Joseph Helm	509-382-2518 /1100	http://www.columbiaco.com/index.aspx?NID=78	
Cowlitz	Brad Thurman	360-577-3098	http://www.co.cowlitz.wa.us/sheriff/	360-577-3092
Douglas	Kevin W. Morris	509-884-0941	https://www.douglascountysheriff.org/293/Sheriff	
Ferry	Ray Maycumber	509-775-3132 or 3136	https://www.ferry-county.com/law_and_justice/sheriff/ index.php	
Franklin	Jim D. Raymond	509-628-0333	http://www.co.franklin.wa.us/sheriff/	509-545-3501
Garfield	Drew Hyer	509-843-3494	http://co.garfield.wa.us/sheriff/home	
Grant	Joe Kriete	509-762-1160	https://www.grantcountywa.gov/524/Sheriffs-Office	509-754-2011
Grays Harbor	Darrin Wallace	360-533-8765	http://www.co.grays-harbor.wa.us/departments/sheriff/ index.php	360-249-3711
Island	Rick Felici	360-679-7310	https://www.islandcountywa.gov/Sheriff/Pages/Home.aspx	360-678-4422
Jefferson	Joe Nole	360-344-9779	https://www.co.jefferson.wa.us/172/Sheriff	360-385-3831
King	Patricia Cole-Tindall	206-296-3311	http://www.kingcounty.gov/depts/sheriff.aspx	206-296-4155
Kitsap	John Gese	360-337-7101	https://www.kitsapgov.com/sheriff/Pages/default.aspx	
Kittitas	Clayton Myers	509-925-8534	http://www.co.kittitas.wa.us/sheriff	509-962-7525
Klickitat	Bob Songer	509-773-4545	http://klickitatcounty.org/373/Sheriff	509-773-4455
Lewis	Robert Snaza	360-740-1105	http://lewiscountywa.gov/sheriff	360-740-1300
Lincoln	Gabe Gants	509-725-3501	https://www.co.lincoln.wa.us/sheriff/	509-725-9263
Mason	Ryan Spurling	360-426-4441	https://masoncountysheriff.us/	360-427-9670
Okanogan	Paul Budrow	509-422-7232 opt 4	http://www.okanogansheriff.org/	509-422-7200
Pacific	Daniel Garcia	360-875-9397	http://www.co.pacific.wa.us/sheriff/	360-875-9395
Pend Oreille	Glenn Blakeslee	509-447-3151 opt 0	http://pendoreilleco.org/your-government/sheriff/	
Pierce	Ed Troyer	253-798-7530	https://www.piercecountywa.gov/121/Sheriff	
San Juan	Eric Peter	360-378-4151	http://www.sanjuanco.com/344/Sheriff	
Skagit	Don McDermott	360-428-3211	http://www.skagitcounty.net/Departments/Sheriff	360-336-9450
Skamania	Summer Scheyer	509-427-9490	http://www.skamaniasheriff.com/	
Snohomish	Adam Fortney	425-407-3999	http://sheriff.snoco.org/	425-388-3414
Spokane	John F. Nowels	509-456-2233	https://www.spokanecounty.org/4616/Sheriff	509-447-5980
Stevens	Brad Manke	509-684-2555	https://stevenscountywa.gov/sheriff	509-684-5296
Thurston	Derek Sanders	360-704-2740	http://www.co.thurston.wa.us/sheriff/	360-786-5500
Wahkiakum	Mark Howie	360-795-3242	https://www.co.wahkiakum.wa.us/149/Sheriffs-Office	
Walla Walla	Mark Crider	509-527-1960 or 3265	https://www.co.walla-walla.wa.us/departments/sheriff/ index.php	509-524-5400
Whatcom	Bill Elfo	360-676-6911	http://www.co.whatcom.wa.us/200/Sheriff	360-676-6650
Whitman	Brett Myers	509-332-2521	https://whitmancounty.org/289/Sheriff	509-397-6266
Yakima	Robert Udell	509-574-2500	http://www.yakimacounty.us/sheriff/	

APPENDIX V RANGER DISTRICT INFORMATION

SECTION V.1 NATIONAL FOREST AND RANGER DISTRICT INFORMATION

SUBSECTION V.1.1 REGION 5 CALIFORNIA

Office	Leadership	E-Mail	Phone	Address
Angeles National Forest	Roman Torres	roman.torres@usda.gov	626-574-1613	701 N. Santa Anita Ave., Arcadia, CA 91006
Los Angeles Gateway Ranger District	Jamahl Butler	nicholas.j.butler@usda.gov	818-899-1900	12371 N. Little Tujunga Canyon Rd., San Fernando, CA 91342
San Gabriel Mountains National Monument	Matthew Bokach	matthew.bokach@usda.gov	626-335-1251	110 N. Wabash Ave., Glendora, CA 91741
Cleveland National Forest	Scott Tangenberg	scott.tangenberg@usda.gov	858-673-6180	10845 Rancho Bernardo Rd Ste. 200, San Diego, CA 92127
Descanso Ranger District	Bob Heiar	robert.heiar@usda.gov	619-445-6235	3348 Alpine Blvd., Alpine, CA 91901
Trabuco Ranger District	Darrell Vance	darrell.vance@usda.gov	951-736-1811	1147 East Sixth St., Corona CA 92879
Palomar Ranger District	Amy Reid	amy.reid@usda.gov	760-788-0250	1634 Black Canyon Rd., Ramona, CA 92065
Eldorado National Forest	Jeff Marsolais	jeffrey.marsolais@usda.gov	530-622-5061	100 Forni Road Placerville, CA 95667
Placerville Ranger District	Scot Rogers	scot.rogers@usda.gov	530-644-2324	4260 Eight Mile Road Camino, CA 95709
Pacific Ranger District Business office only	Dionne Uzes	dionne.uzes@usda.gov	530-644-2349	7887 Hwy 50, Pollock Pines, CA 95726-9602
Georgetown Ranger District	Joe Garrotto	joseph.garrotto@usda.gov	530-333-4312	7600 Wentworth Springs Rd., Georgetown, CA 95634
Amador Ranger District	Chuck Loffland	Charles.Loffland@usda.gov	209-295-4251	26820 Silver Dr., Pioneer, CA 95666
Humboldt-Toiyabe National Forest	William Dunkelberger	William Dunkelberger	775-331-6444	1200 Franklin Way, Sparks, NV 89431
Austin-Tonopah Ranger District	Lance Brown	lance.brown@usda.gov	775-964-2671 775-482-6286	100 Midas Canyon Rd/P.O. Box 130, Austin, NV 89310 1400 S. Erie Main St./P.O. Box 3940, Tonopah, NV 89049
Bridgeport Ranger District	Megan Mullowney	megan.mullowney@usda.gov	760-932-7070	75694 US-395 HC 62 Box 1000, Bridgeport, CA 93517
Carson Ranger District	Matthew Zumstein	matthew.zumstein@usda.gov	775-882-2766	1536 South Carson St., Carson City, NV 89701
Ely Ranger District	Jose Noriega	jose.noriega@usda.gov	775-289-3031	825 Avenue E, Ely, NV 89301
Mountain City-Ruby Mountains-Jarbridge Ranger District	Josh Nicholes	joshua.nicholes@usda.gov	775-738-5171 775-752-3357	660 South 12th St., Ste. 108, Elko, NV 89801 140 Pacific Ave./P.O. Box 246, Wells, NV 89835
Santa Rosa Ranger District Ranger District	Boyd Hatch	boyd.hatch@usda.gov	775-623-5025 ext. 4	3275 Fountain Way, Winnemucca, NV 89445
Inyo National Forest	Lesley Yen	lesley.yen@usda.gov	760-873-2400	351 Pacu Ln. Suite 200, Bishop, CA 93514-3101
Mt. Whitney Ranger District	Julie Hall	julie.hall2@usda.gov	760-876-6200	640 South Main St./P.O. Box 8, Lone Pine, CA 93545
White Mountain Ranger District	Philip DeSenze	philip.desenze@usda.gov	760-873-2500	798 North Main St., Bishop, CA 93514
Mammoth Ranger District	Fred Wong	winfred.wong@usda.gov	760-924-5500	2500 Hwy 203, Mammoth Lakes, CA 93546
Mono Lake Ranger District	Stephanie Heller	stephanie.heller@usda.gov	760-647-3044	P.O. Box 429, Lee Vining, CA 93541
Klamath National Forest	Rachel Smith	rachel.c.smith@usda.gov	530-842-6131	1711 South Main St., Yreka, CA 96097-9549
Goosenest Ranger District	Drew Stroberg	drew.stroberg@usda.gov	530-398-4391	37805 Hwy 97, Macdoel, CA 96058
Happy Camp & Oak Knoll Ranger District	Robero Beltran	roberto.beltran@usda.gov	530-493-2243	63822 Hwy 96/P.O. Box 377, Happy Camp, CA 96039
Salmon/Scott River Ranger District	Nathalie Kelly	natalie.kelly@usda.gov	530-468-5351	11263 N. Hwy 3, Fort Jones, CA 96032-9702
Lake Tahoe Basin Management	Erick Walker	erick.walker@usda.gov	530-543-2600	35 College Dr, South Lake Tahoe, CA 96150
Lassen National Forest	Deb Bumpus	debra.bumpus@usda.gov	530-257-2151	2550 Riverside Dr., Susanville, CA 96130

Office	Leadership	E-Mail	Phone	Address
Almanor Ranger District	Russell Nickerson	russell.nickerson@usda.gov	530-258-2141	900 E. Hwy 36/P.O. Box 767, Chester, CA 96020
Eagle Lake Ranger District	VACANT		530-257-4188	477-050 Eagle Lake Rd., Susanville, CA 96130
Hat Creek Ranger District	Robin Wall	robin.k.wall@usda.gov	530-336-5521	43225 E. Hwy. 299/P.O. Box 220, Fall River Mills, CA 96028
Los Pasdres National Forest	Christopher Stubbs	christopher.stubbs@usda.gov	805-968-6640 or 805-448-6487	1980 Old Mission Drive, Solvang CA 93463
Mt. Pinos Ranger District	Karina Medina	Karina.medina@usda.gov	661-245-3731	34580 Lockwood Valley Rd., Frazier Park, CA 93225
Ojai Ranger District	Tim Short	timothy.short@usda.gov	805-646-4348	1190 E. Ojai Ave., Ojai, CA 93023
Santa Barbara Ranger District	Daryl Hodges	daryl.hodges@usda.gov	805-967-3481	3505 Paradise Rd., Santa Barbara, CA 93105
Santa Lucia Ranger District	Micheal Papa	michael.papa@usda.gov	805-623-0328	1616 N. Carlotti Dr., Santa Maria, CA 93454
Monterey Ranger District	Fin Eifert	john.eifert@usda.gov	831-667-2315	406 S. Mildred St., King City, CA 93930
Mendocino National Forest	Wade McMaster	wade.mcmaster@usda.gov	530- 34-3316	825 North Humboldt Ave., Willows, CA 95988
Upper Lake/Covelo Ranger District	Frank Aebly	frank.aebly@usda.gov	707-275-2361	10025 Elk Mountain Rd., Upper Lake, California 95485
Covelo Ranger District	Frank Aebly	frank.aebly@usda.gov	707-983-6118	78150 Covelo Rd., Covelo, California 95428
Grindstone Ranger District	Loren Everest	loren.everest@usda.gov	530-934-3316	825 North Humboldt Ave., Willows, California 95988
Modoc National Forest	Chris Christofferson	chris.christofferson@usda.gov	530-233-8709	225 West 8th St., Alturas, California 96101
Big Valley Ranger District	Milton Stubbs	milton.stubbs@usda.gov	530-299-3215	508 South Main St./P.O. Box 159, Adin, CA 96006
Doublehead Ranger District	Milton Stubbs	milton.stubbs@usda.gov	530-667-2246	49870 State Hwy 139, Tulelake, CA 96134
Devil's Garden Ranger District	VACANT		530-233-5811	225 West 8th St., Alturas, CA 96101
Warner Mountain Ranger District	VACANT		530-279-6116	710 Townsend St./P.O. Box 220, Cedarville, CA 96104
Plumas National Forest	Chris Carlton	christopher.carlton@usda.gov	530-283-2050	159 Lawrence St., Quincy, CA 95971-6025
Beckwourth Ranger District	Michael Rahe	michael.rahe@usda.gov	530-836-2575	23 Mohawk Hwy/P.O. Box 7, Blairsden, CA 96103
Feather River Ranger District	David Brillenz	david.brillenz@usda.gov	530-534-6500	875 Mitchell Ave., Oroville, CA 95965-4699
Mt. Hough Ranger District	Joseph Hoffman	joseph.hoffman@usda.gov	530-283-0555	39696 State Hwy 70, Quincy, CA 95971
San Bernardino National Forest	Danelle D. Harrison	danelle.harrison@usda.gov	909-382-2600	602 South Tippecanoe Ave., San Bernardino, CA 92408
Mountaintop Ranger District	Freddie W. Duncan	freddie.duncan@usda.gov	909-382-2790	40971 North Shore Drive, Highway 38/P.O. Box 290, Fawnskin, CA 92333
San Jacinto Ranger District	Travis Mason	Travis.Mason@usda.gov	909-382-2921	54270 Pine Crest/P.O. Box 518, Idyllwild, CA 92549
Sand to Snow National Monument	Jihadda Govan	jihadda.govan@usda.gov	909-382-2697	
Santa Rosa and San Jacinto Mountains National Monument (BLM)	Danielle “Dani” Ortiz	ddortiz@blm.gov	760-862-9984	51500 Highway 74, Palm Desert, CA 92260
Front Country Ranger District	Joe Rechsteiner	joseph.rechsteiner@usda.gov	909-382-2851	1209 Lytle Creek Rd., Lytle Creek, CA 92358
Sequoia National Forest	Teresa Benson	Teresa Benson	559-784-1500	1839 South Newcomb St., Porterville, CA 93257
Hume Lake Ranger District	Jeremy Dorsey	jeremy.dorsey@usda.gov	559-338-2251	35860 East Kings Canyon Rd., Dunlap, CA 93621
Western Divide Ranger District	Eric LaPrice	eric.laprice@usda.gov	559-539-2607	32588 Highway 190, Springville, CA 93265
Kern River Ranger District	Alfred Watson	alfred.watson@usda.gov	760-376-3781	11380 Kernville Rd., Kernville, CA 93238
Giant Sequoia National Monument	Eric LaPrice	eric.laprice@usda.gov	559-784-1500	1839 S Newcomb St, Porterville, CA 93257
Shasta-Trinity National Forest	Rachel Birkey	rachel.birkey@usda.gov	530-226-2500	3644 Avtech Parkway, Redding, CA 96002
McCloud/Shasta Ranger District	Carolyn Napper	Carolyn.Napper@usda.gov	530-964-2184	2019 Forest Road/P.O. Box 1620, McCloud, CA 96057

Office	Leadership	E-Mail	Phone	Address
South Fork Management Unit Hayfork Ranger District Yolla Bolla Ranger District (CLOSED)	VACANT		530-628-5227	111 Trinity Street/P.O. Box 159, Hayfork, CA 96041
Trinity River Management Unit Weaverville Ranger District Big Bear Ranger District (CLOSED)	Tara Jones	tara.jones@usda.gov	530-623-2121	360 Main Street/P.O. Box 1190, Weaverville, CA 96093
Whiskeytown -Shasta-Trinity National Recreation Area Shasta Lake Ranger District	Sara Acridge	sara.acridge@usda.gov	530-275-1587	14225 Holiday Road, Redding, CA 96003
Sierra National Forest	Dean Gould	dean.gould@usda.gov	559-297-0706	1600 Tollhouse Rd, Clovis, CA 93611
Bass Lake Ranger District	Jennifer Christie	jennifer.a.christie@usda.gov	559-877-2218	57003 Road 225, North Fork, CA 93643
High Sierra Ranger District	Kim Sorini	kim.sorini@usda.gov	559-855-5355	29688 Auberry Rd./P.O. Box 559, Prather, CA 93651
Six Rivers National Forest	Ted McArthur	ted.mcarthur@usda.gov	707-442-1721	1330 Bayshore Way, Eureka, CA 95501
Lower Trinity Ranger District	Roberto Beltran	roberto.beltran@usda.gov	530-629-2118	580 Highway 96/P.O. Box 68, Willow Creek, CA 95573
Mad River Ranger District	Kristen Lark	kristen.lark@usda.gov	707-574-6233	741 Highway 36, Bridgeville, CA 95526
Orleans Ranger District	Nolan Colegrove	nolan.colegrove@usda.gov	530-627-3291	1 Ishi Pishi Road/P.O. Box 410, Orleans, CA 95556
Gasquet/Smith River Ranger District	Kathy Allen	kathy.m.allen@usda.gov	707-457-3131	10600 Highway 199/P.O. Box 228, Gasquet, CA 95543
Stanislaus National Forest	Jason Kuiken	jason.kuiken@usda.gov	209-532-3671	19777 Greenley Road, Sonora, CA 95370
Mi-Wok and Summitt Ranger District	Sarah LaPlante	sarah.laplante@usda.gov	209-965-3434	#1 Pinecrest Lake Road, Pinecrest, CA 95364
Calaveras Ranger District	Ray Cablayan	raymond.cablayan@usda.gov	209-795-1381, 209-753-2811	5519 Highway 4/P.O. Box 500, Hathaway Pines, CA 95233
Groveland Ranger District	Jim Junette	james.junette@usda.gov	209-962-7825	24545 Highway 120, Groveland, CA 95321
Tahoe National Forest	Eli Ilano	Eliseo.ilano@usda.gov	530-265-4531	631 Coyote Street, Nevada City, CA 95959
American River Ranger District	Mary Grim	mary.grim@usda.gov	530-492-5631	22830 Foresthill Road, Foresthill CA 95631
Sierraville Ranger District	Rachel Hutchinson	Rachel.Hutchinson@usda.gov	530-994-3401	317 So. Lincoln St./PO Box 95, Sierraville CA 96126
Truckee Ranger District	Jonathan Fisher	jonathan.fisher@usda.gov	530-536-0417	10811 Stockrest Springs Road, Truckee CA 96161
Yuba River Ranger District	Andrew Mishler	andrew.mishler@usda.gov	530-326-8259	15924 Highway 49, Camptonville CA 95922

SUBSECTION V.1.2 REGION 6 OREGON

Office	Leadership	E-Mail	Phone	Address
Deschutes National Forest	Holly Jewkes	holly.jewkes@usda.gov	541-383-5300	63095 Deschutes Market Rd, Bend, OR 97701
Bend-Ft. Rock Ranger District	Kevin Larkin	kevin.larkin@usda.gov	541- 383-5300	63095 Deschutes Market Rd, Bend, OR 97701
Crescent Ranger District	Robert Gentry	robert.gentry@usda.gov	541- 433-3200	136471 Hwy 97 North/P.O. Box 208, Crescent, OR 97733
Sisters Ranger District	Ian Reid	ian.reid2@usda.gov	541- 549-7700	201 N. Pine St/P.O. Box 249, Sisters, OR 97759
Redmond Air Center	Maurice Evans	maurice.evans@usda.gov	(541- 504-7200	1740 SE Ochoco Way, Redmond, OR 97756
Ochoco National Forest	Shane Jeffries	shane.jeffries@usda.gov	541-416-6500	3160 NE 3rd St, Prineville, OR 97754
Crooked River National Grassland & Lookout Mountain Ranger District	Slater Turner	slater.turner@usda.gov	541-416-6640	274 SW 4th St, Madras, OR 97741
Paulina Ranger District	Johanna Kovarik	johanna.kovarik@usda.gov	541-416-6500	3160 NE 3rd St, Prineville, OR 97754
Fremont-Winema National Forest	Erik Fey		(541- 947-2151	1301 South G St, Lakeview, OR 97630
Bly Ranger District	Sandra Patania		541- 353-2427	61100 Hwy 140 E, Bly, OR 97622
Lakeview Ranger District	Sandra Patania		541- 947-6300	18049 Hwy 395, Lakeview, OR 97630
Chemult Ranger District	Judd Lehman	judd.lehman@usda.gov	541- 365-7001	110500 Hwy 97 N, Chemult, OR 97731
Chiloquin Ranger District	Judd Lehman	judd.lehman@usda.gov	541- 783-4001	38500 Hwy 97 N, Chiloquin, OR 97624
Klamath Ranger District	Melanie Fullman	melanie.fullman@usda.gov	541- 883-6714	2819 Dahlia St, Ste A, Klamath Falls, OR 97601
Silver Lake Ranger District	Jeannette Wilson	jeannette.wilson@usda.gov	541- 576-2107	65600 Hwy 31, Silver Lake, OR 97638
Paisley Ranger District	Jeannette Wilson	jeannette.wilson@usda.gov	541- 943-3114	303 Hwy 31, Paisley, OR 97636
Malheur National Forest	Ann Niesen (acting)	ann.niesen@usda.gov	541-575-3000	431 Patterson Bridge Rd/P.O. Box 909, John Day, OR 97845
Blue Mountain Ranger District	Sally Christensen	sally.christensen@usda.gov	541-575-3000	431 Patterson Bridge Rd/P.O. Box 909, John Day, OR 97845
Emigrant Creek Ranger District	Josh Giles	joshua.giles@usda.gov	541-573-4300	265 Hwy 20 S, Hines, OR 97738
Prairie City Ranger District	Jeremy Loud	Jeremy.Loud@usda.gov	541-820-3800	327 SW Front St/P.O. Box 337, Prairie City, OR 97869
Mount Hood National Forest	Meta Loftsgaarden	meta.loftsgaarden@usda.gov	503- 668-1700	16400 Champion Way, Sandy, OR 97055
Barlow Ranger District	Kameron Sam	kameron.sam@usda.gov	541- 467-2291	780 NE Court St, Dufur, OR 97021
Clackamas River Ranger District	Curtis Booher	curtis.booher@usda.gov	971- 333-4100	16400 Champion Way, Sandy, OR 97055
Hood River Ranger District	Kameron Sam	kameron.sam@usda.gov	541- 352-6002	6780 Hwy 35, Parkdale, OR 97041
Zigzag Ranger District	Bill Westbrook	wallace.westbrook@usda.gov	503- 622-3191	70220 E Hwy 26, Zigzag, OR 97049
Rogue River – Siskiyou National Forest	Merv George, Jr.	merv.george@usda.gov	541- 618-2200	3040 Biddle Road Medford, Oregon 97504
Siskiyou Mountains Ranger District	Jen Sanborn	jennifer.sanborn@usda.gov	541- 899-3800	6941 Upper Applegate Rd, Jacksonville, OR 97530
Powers Ranger District	James Courtright (Acting)	james.courtright@usda.gov	541- 439-6200	42861 Highway 242 Powers, OR 97466
Wild Rivers Ranger District	Scott Blower	scott.blower@usda.gov	541- 592-4000	26568 Redwood Hwy, Cave Junction, OR 97523
Gold Beach Ranger District	Liz Bly-Stephens (Acting)	elizabeth.bly@usda.gov	541- 247-3600	29279 Ellensburg Avenue, Gold Beach, OR 97444
High Cascades Ranger District	David Palmer	david.palmer@usda.gov	541- 560-3400	47201 Highway 62 Prospect, OR 97536-9724
Siuslaw National Forest	Robert Sanchez	robert.f.sanchez@usda.gov	541-750-7000	3200 SW Jefferson Way, Corvallis, OR 97331
Hebo Ranger District	Shawn Rivera	Shawn.Rivera@usda.gov	503-392-5100	31525 Hwy 22/P.O. Box 235, Hebo, OR 97122
Central Coast Ranger District	Michele Holman	michele.holman@usda.gov	541-563-8400	1130 Forestry Ln/P.O. Box 400, Waldport, OR 97394

Office	Leadership	E-Mail	Phone	Address
Oregon Dunes NRA	Michele Holman	michele.holman@usda.gov	541-271-6000	855 Hwy 101, Reedsport, OR 97467
Willamette National Forest	David Warnack	david.warnack@usda.gov	541-225-6300	3106 Pierce Parkway Ste D, Springfield, OR 97477
Detroit Ranger District	Megan Crowder	Megan.Crowder@usda.gov	503-854-3366	44125 N Santiam Hwy SE, Detroit, OR 97342 HC73, Box 320, Mill City, OR 97360
Middle Fork Ranger District	Molly Juillerat	molly.juillerat@usda.gov	541-782-2283	46375 Hwy 58, Westfir, OR 97492
McKenzie River Ranger District	Darren Cross	darren.cross@usda.gov	541-822-3381	57600 McKenzie Hwy, McKenzie Bridge, OR 97413
Sweet Home Ranger District	Nikki Swanson	nicola.swanson@usda.gov	541-367-5168	4431 Hwy 20, Sweet Home, OR 97386
Umatilla National Forest	Eric Watrud	eric.watrud@usda.gov	541- 278 3716	72510 Coyote Rd, Pendleton, Oregon 97801
Heppner Ranger District	Doug McKay	douglas.mckay@usda.gov	541- 676 9187	P.O. Box 7, Heppner, OR 97836
North Fork John Day Ranger District	Stephaney Kerley	stephaney.kerley@usda.gov	541- 427 3231	P.O. Box 158, Ukiah, OR 97880
Pomeroy Ranger District	Susan Piper	susan.piper@usda.gov	509- 843 1891	71 West Main, Pomeroy, WA 99347
Walla Walla Ranger District	Aaron Gagnon	aaron.gagnon@usda.gov	509- 522 6290	1415 West Rose St, Walla Walla, WA 99362
Umpqua National Forest	Alice Carlton	alice.carlton@usda.gov	541- 957-3200	2900 NW Stewart Parkway, Roseburg, OR 97471
Cottage Grove Ranger District Administrative Office Only: no visitor services	David Andersen	david.andersen@usda.gov	541- 767-5000	34963 Shoreview Dr, Cottage Grove, OR 97424
Diamond Lake Ranger District	Mark Sommer	mark.sommer@usda.gov	541- 498-2531	2020 Toketee Ranger Station Rd, Idleyld Park, OR 97447
North Umpqua Ranger District	David Andersen	david.andersen@usda.gov	541- 496-3532	18782 N Umpqua Hwy, Glide, OR 97443
Tiller Ranger District	Gabe Wishart	gabriel.j.wishart@usda.gov	541- 825-3100	27812 Tiller Trail Hwy, Tiller, OR 97484
Wallowa-Whitman National Forest	Shaun McKinney	shaun.mckinney@usda.gov	541-523-6391	1550 Dewey Ave Ste. A, Baker City, OR 97814
Hells Canyon NRA	Mike Ball	michael.ball@usda.gov	509-758-0616	2535 Riverside Dr/P.O. Box 699, Clarkston, WA 99403
Whitman Ranger District	Kendall Cikanek	kendall.cikanek@usda.gov	541-523-6391	1550 Dewey Ave, Ste A, Baker City, OR 97814
La Grande Ranger District	Bill Gamble	william.gamble@usda.gov	541-962-8500	3502 Hwy 30, La Grande, Oregon 97850
Wallowa Valley & Eagle Cap Ranger District Office	Brian Anderson	brian.t.anderson@usda.gov	541-426-5546, 541-426-4978	201 E Second Street/P.O. Box 905, Joseph, OR 97846

SUBSECTION V.1.3 REGION 6 WASHINGTON

Office	Leadership	EMail	Phone	Address
Colville National Forest	Rodney Smoldon	rodney.smoldon@usda.gov	509-684-7000	765 South Main, Colville, WA 99114
Three Rivers Ranger District	Marshell Moy	marshell.moy@usda.gov	509-738-7700	255 W. 11th Ave., Kettle Falls, WA 99141
Republic Ranger District	Travis Fletcher	travis.fletcher@usda.gov	509-775-7400	650 East Delaware Ave., Republic, WA 99166
Newport Ranger District	Carin Vadala	carin.e.vadala@usda.gov	509-447-7300	315 North Warren, Newport, WA 99156
Sullivan Lake Ranger District Seasonally staffed	Carin Vadala	carin.e.vadala@usda.gov	509-447-7300	12641 Sullivan Lake Rd., Metaline Falls, WA 99153
Tonasket Ranger District	Matt Marsh	Matthew.Marsh@usda.gov	509-486-2186	1 West Winesap, Tonasket, WA 98855
Gifford Pinchot National Forest	Johanna Kovarik		360-891-5000	987 McClellan Rd., Vancouver, WA 98661
Cowlitz Valley Ranger District	Teresa Tanner	theresa.tanner@usda.gov	360-497-1100	10024 US Hwy 12/P.O. Box 670, Randle, WA 98377
Mt. Adams Ranger District	Erin Black	erin.black@usda.gov	509-395-3400	2455 Hwy 141, Trout Lake, WA 98650
Mount St. Helens Monument	Samuel D. Grimm (acting)	samuel.grimm@usda.gov	360-449-7800	42218 NE Yale Bridge Rd., Amboy, WA 98601
Mt. Baker-Snoqualmie National Forest	Jody Weil	jody.weil@usda.gov	425-783-6000	2930 Wetmore Ave., Ste 3A, Everett, WA, 98201
Darrington Ranger District	Greta Smith	gretchen.v.smith@usda.gov	360-436-1155	1405 Emens Ave. N., Darrington, WA 98241
Mt. Baker Ranger District	Louis “Ted” Neff	louis.neff@usda.gov	360-854-2553	810 State Route 20, Sedro-Woolley, WA 98284
Skykomish Ranger District	Joseph (Joe) Neal	joseph.neal@usda.gov	360-677-2414	74920 NE Stevens Pass Hwy/ P.O. Box 305, Skykomish, WA 98288
Snoqualmie Ranger District	Martie Schramm	martie.schramm@usda.gov	425-888-1421	902 SE North Bend Way, Bldg 1, North Bend, WA 98045
Okanogan-Wenatchee National Forest	Kristin Bail	kristin.bail@usda.gov	509-664-9200	215 Melody Ln., Wenatchee, WA 98801
Chelan Ranger District	Paul Willard	paul.willard@usda.gov	509-682-4900	428 W. Woodin Ave., Chelan, WA 98816-9724
Cle Elum Ranger District	Joe Rausch	joseph.rausch@usda.gov	509-852-1100	803 W. 2nd St., Cle Elum, WA 98922
Entiat Ranger District	Paul Willard (acting)	paul.willard@usda.gov	509-784-4700	2108 Entiat Way/P.O. Box 476, Entiat, WA 98822
Methow Valley Ranger District	Chris Furr	chris.furr@usda.gov	509-996-4000	24 West Chewuch Rd., Winthrop, WA 98862
Naches Ranger District	Aaron Stockton	aaron.stockton@usda.gov	509-653-1401	10237 Highway 12, Naches, WA 98937
Wenatchee River Ranger District	Erica Taecker	erica.taecker@usda.gov	509-548-2550	600 Sherbourne, Leavenworth, WA 98826
Olympic National Forest	Kelly Lawrence	kelly.lawrence2@usda.gov	360-956-2402	1835 Black Lake Blvd SW, Olympia, WA 98512
	Susan Beall	Deputy Forest Supervisor susan.beall@usda.gov		
	Robin Shoal	Natural Res Staff Officer robin.shoal@usda.gov		
Hood Canal Ranger District	Yewah Lau	yewah.lau@usda.gov	360-765-2200	295142 Highway 101 S., Quilcene, WA 98376

Office	Leadership	EMail	Phone	Address
Pacific Ranger District-Forks			360-374-6522	437 Tillicum Ln., Forks, WA 98331
Pacific Ranger District-Quinault			360-288-2525	353 South Shore Rd./P.O. Box 9, Quinault, WA 98575
Umatilla National Forest	Eric Watrud	eric.watrud@usda.gov	541-278 3716	72510 Coyote Rd., Pendleton, Oregon 97801
Pomeroy Ranger District	Susan Piper	susan.piper@usda.gov	509-843 1891	71 West Main, Pomeroy, Washington 99347
Walla Walla Ranger District	Aaron Gagnon	aaron.gagnon@usda.gov	509-522 6290	1415 West Rose St., Walla Walla, Washington 99362
Heppner Ranger District	Doug McKay	douglas.mckay@usda.gov	541-676 9187	P.O. Box 7, Heppner, Oregon 97836
North Fork John Day Ranger District	Stephaney Kerley	stephaney.kerley@usda.gov	541-427 3231	P.O. Box 158, Ukiah, Oregon 97880
Idaho Panhandle National Forest	Carl Petrick	carl.petrick@usda.gov	208-765-7223	3232 West Nursery Rd., Coeur d'Alene, ID 83815
Priest Lake Ranger District	Matt Davis	matthew.davis@usda.gov	208-443-2512	32203 Highway 57, Priest River, ID 83856
Bonners Ferry Ranger District	Kevin Knauth	kevin.knauth@usda.gov	208-267-5561	6286 Main St., Bonners Ferry, ID 83805

APPENDIX W SUMMARY OF MANUAL CHANGES

SECTION W.1 SUMMARY OF MANUAL CHANGES

2022 to 2023 PFSL Manual			
Location		**Change**	**Source**
Chapter: Plot Layout and Referencing			
Section 3.7	Monumenting and Referencing Plots In National Parks	Removed reference to the MOU, as the MOU has expired.	Bug 2429
Chapter: Plot Level Data			
Item 4.2.1.22	Urban Area	Removed references to NUE species; the NUE species list has been removed from the Core manual.	Bug 2540
Item 4.3.4.6	Subplot Examined	Text indicating use for “plots viewed from a distance” moved from code 4 to code 1.	Bug 2498
Item 4.3.8.2	Plot Narrative	NRCS species codes added as acceptable for describing vegetation.	Bug 2496
Item 4.4.3.13	GPS Filename	Updated description to, “MIDAS will autofill the GPS filename when GPS UNIT TYPE = 3 and GPS LOCATION TYPE = 15-18.”	Bug 2504
Chapter: Condition Class			
Section 5.1	Determination of Condition Class	Step 1, Recognizing the CONDITION CLASS STATUS on the subplots/macroplots, When NONFOREST SAMPLING STATUS = 0. Updated text to reflect nationally agreed upon region text until core discussion is resolved.	Bug 2534
Subsection 5.2.2	Nonforest Land	From Macroplots With Nonforest and Nonsampled Conditions, deleted sentence, “Delineate and map between nonforest and nonsampled conditions only if the macroplot currently contains or contained accessible forest land at the previous visit.”	Bug 2512
Section 5.4	Delineating Condition Classes Differing in Condition Class Status	Deleted number 6 regarding areas that were previously forest and are now new nonforest conditions.	Bug 2528
Item 5.7.0.8	Forest Land Condition Status Change	Added coding key.	Bug 2533
Item 5.7.1.12	Previous Stand Size Class	Deleted code 6, chaparral. Values table updated to reference STAND SIZE CLASS, as previous values match current values.	2013 Manual Values
Item 5.7.2.8	Age Basis Code	Clarified code 60 to include both species or size which cannot be bored. Reworded code 70 description.	Change Proposal 2022-14, Bug 2523
Item 5.7.2.14	Previous Ground Land Class	Deleted code 150, Other forest - curlleaf mountain mahogany. Values table updated to reference CURRENT GROUND LAND CLASS, as previous values match current values.	2013 Manual Values
Item 5.7.2.45	Previous Treatment	Updated values to excluding 18 and 19, which were not valid at the previous inventory.	2013 Manual Values
Chapter: Subplot Attributes			
Item 6.2.2.1	Root Disease Severity Rating	Added text describing the use of canopy reduction for assessing severity rating.	Bug 2409
Chapter: Tree and Sapling Data			
Item 8.5.1.4	Previous Tree Tag Number	Removed reference to PNW POT KIND from When Collected.	Bug 2534
Item 8.5.1.10	Standing Dead	For old, decaying snags, such as those found in Pacific Northwest, use regional guidelines to help determine whether a tree is missing wood due to fracturing or rot.	Bug 2497
Subsection 8.6.4	Diameter at Breast Height	#9, deleted sentence, “Note: for standing dead trees missing 25% or more of the diameter estimate a reconstructed diameter for Item 8.6.4.4, SNAG ESTIMATED DIAMETER (AFSL, PFSL).”	Change Proposal 2022-4

	Snag Estimated Diameter	Deleted data item.	Change Proposal 2022-4
Item 8.8.0.5	Rotten/Missing Cull	Updated description for calculating snag missing cull to remove reference to the estimated diameter.	Change Proposal 2022-4
Item 8.8.0.6	Rough Cull	Updated instruction for determining rough cull. Updated when collected to include all live conifers, red alder, and big leaf maple.	Change Proposal 2022-3, Bug 2524
Chapter: Site Tree Information			
Item 10.5.1.5	Condition Class List	Updated instruction for downloaded, invalid site trees.	Bug 2454
Chapter: Down Woody Materials			
Item 11.9.2.6	Duff Depth	Added instruction for duff depth between 5 and 24 inches.	Change Proposal 2022-16
Appendix: Tree Coding Guide			
Section F.1	Tree Coding Guide	Added to description of previous Reference Only, present Standing Dead 1.0 + DBH, “(previous tree status will need to be updated to 1 or 2).”	Bug 2448
Appendix: Sudden Oak Death Syndrome Assessment			
Section J.1	Sudden Oak Death Syndrome Assessment	Updated Portland Forestry Sciences Lab address.	
Appendix: Douglas-Fir Tree Core Special Study			
Subsection K.2.1	Tree Selection	Added Klamath Falls duty station to when collected.	Bug 2538
Subsection K.3.2	Core Shipping	Updated Portland Forestry Sciences Lab address.	
Appendix: Completing a Plot			
Section R.8	Landowner Contact Form and NOMS Owner Report	Deleted paragraph instructing CalFire contract crews to complete the Landowner Contact Form.	Bug 2511
Section R.11	Summary of Electronic Plot Folder File Names and Folder Locations	Added JAVAD file extension .JPS as acceptable GPS ROVER file type for production, blind, and cold check plots.	Bug 2501
Applied version 9.2 Core changes			

APPENDIX X CORE 9.2 CHANGES

SECTION X.1 CORE 9.2 CHANGES

Changes from the Phase 2 Field Guide version 9.1 to version 9.2

These change pages are intended to highlight significant changes to the field guide.

1.12 FIELD GUIDE REVISION. Changed the value from 9.1 to 9.2.

2.0 CONDITION CLASS. Replaced figures 2-2, 2-3, and 2-4.

2.2 Condition Class Status Definitions. 1. Accessible Forest Land. Clarified the caption of figure 2-8.

2.4.3 FOREST LAND CONDITION STATUS CHANGE - New Forest Condition or Loss of Previous Forest Condition. Clarified the text in the example part of the description.

2.5.30.1 Canopy Cover Sample Method. Replaced figure 2-20.

2.5.7 OWNER CLASS. Clarified codes 41, 43, and 45.

3.20 UNLISTED TREE PRESENT. Added information relating to the changes in the Master Species List. Also clarified the instructions of when to record the variable.

3.23. UNLISTED TREE SPECIES COUNT. Modified the text, and changed the values from "1 to 99" to "0 to 99".

4.1 Reference Procedure. In the list of additional rules under paragraph 4, added a sentence at the end of rule 1.

5.4. AZIMUTH. Clarified the text.

5.7.1 RECONCILE. Clarified code 8.

5.8 SPECIES. Made the following changes.

Added text to accommodate the changes in the Master Species list.

Deleted the table and all references to Non-urban exclusions (NUE).

Deleted the table list of National Forest System (NFS) exclusions.

Deleted the table of Mainland Exclusions (MLE).

Deleted old Figure 37. National Forest System (NFS) Regions.

Added Figure 5-9. Description of the Master Species List.

Added Table 5-1. List of species separating the Island and Mainland Sub-lists; these species are referred to as Island Only Species (IOS).

Added Figure 5-10. Map of the nine P2/3 National Forest System Regional Boundary (NFS) Sub-list areas.

Added Table 5-2. List of species associated with the nine P2/3 National Forest System Regional Boundary (NFS) Sub-lists.

For specifics in changes to the species on each list, please see the description of Appendix 3 below or Appendix 14, or both.

5.9. DIAMETER. Under the section Remeasurement Trees, clarified the text in the first paragraph. Also clarified the text in exception 3, and added exception 4. Also added a new figure, 5-11, to illustrate exception 4.

5.9.2 DIAMETER AT BREAST HEIGHT (DBH). In Item 1, replaced figure 5-14 and clarified the caption.

5.9.2 DIAMETER AT BREAST HEIGHT (DBH). In item 2, clarified the text. Also clarified the caption text of figure 5-24.

5.9.2 DIAMETER AT BREAST HEIGHT (DBH). In item 11, added a sentence to the first paragraph. Also replaced figure 5-33. Under the fourth bullet, added a sentence to the end of the text. Also replaced figure 5-34.

5.14 TOTAL LENGTH. Added a clarifying sentence to the end of the text.

5.15 ACTUAL LENGTH. Clarified the text.

5.20. CROWN DIEBACK (CORE OPTIONAL P2 CORE P3). Added this variable from the old P3 field guide. Renumbered the sections following the addition.

5.21.1 DAMAGE AGENT 1. Code 24000. Changed the Damage Threshold from "Damage ?20% of crown affected" back to "Damage ?20% dieback of crown area". Also deleted text from the Description column that was added in version 9.1. These changes correct text for code 24000 that was incorrectly modified in version 9.1.

8.2 General definitions. Under Growth Habits, added information relating to the changes in the Master Species List.

8.4 Vegetation Structure. Made the following modifications:

Under Vegetation Structure Growth Habits, added a new second sentence to the paragraph.

Under Vegetation Structure Growth Habits, Tally Tree Species (TT), and Non-tally Tree Species (NT), added information relating to the changes in the Master Species List .

8.5.1 SPECIES GROWTH HABIT. Made the following modifications:

Modified the text in paragraphs 1, 4, and 5.

In footnote 2, added information relating to the changes in the Master Species List.

10.4.3.7 SPECIES (BASE). In the first paragraph, added information relating to the changes in the Master Species List.

Added a new section 11. Soil Measurements and Sampling - Introduction (CORE OPTIONAL).

Appendix 3 Species List. Made the following changes

Modified the first introductory paragraph above the species code list to accommodate changes in the Master Species List change proposal

Changed the labels and content of the first three columns

Added Islands only species (IOS) - 300

Deleted Islands only species - 8472 from the Master Species list but MLE was not in Appendix 3.

Added at least 1 NFS region under NFS Region Sub-list - 508, 772, 902, 6524, 7469, 7577, 7578, 8345, 8504

Deleted at least 1 NFS region under NFS Region Sub-list - 461, 463, 763, 768

Deleted species - 928, 5192, 5436, 7579, 7637, 8112

Added species 6856 (Cycas micronesica) to the species code list .

Appendix 6. Glossary. Added definitions for the following terms: Islands Only Species (IOS), P2/3 Sub-lists , and Subplot-condition . Deleted the following terms: Mainland Exclusion (MLE), Non-Urban Exclusion (NUE). Also, modified definitions for the following terms: Master Species List, Urban areas, Bole, Inclusion, and TOTAL LENGTH.

Appendix 7. Tolerance/MQO/Value/Units/Field Width/When Collected table. Changed Value of Field Guide Version from "9.1" to "9.2". Updated the appendix for changes to UNLISTED TREE PRESENT. Updated the UNLISTED TREE SPECIES COUNT values from "1 to 99" to "0 to 99". Added CROWN DIEBACK information. Corrected spelling in When Collected of DUFF DEPTH (BASE), LITTER DEPTH (BASE), and DUFF AND LITTER METHOD (BASE).

Appendix 8. Tree Coding Guide. Made the following changes:

Modified the Previous Measurement text in lines 6, 9, 10, 28, and 29.

Changed the section title "SAMPLE KIND 2 (Remeasure) Added or Missed Trees" to "SAMPLE KIND 2 (Remeasure) Added or Missed Trees and Cruiser Error".

Modified the Previous Measurement and Present Measurement text in line 38.

Added new coding instructions lines at new 40, 41, 42, 55, 56, 57, and 58 and renumbered the lines coming after them.

Deleted old number 51 line.

Modified the Previous Measurement and Present Measurement text in lines numbered new 53, 54, 60, 61, and 62.

Modified the Previous Measurement text in line numbered new 63.

Modified the Present Measurement text in lines numbered new 65, 66, and 67.

Appendix 11. Damage Codes. Corrected the common name spelling of code 11004 from "Jeffery pine beetle" to "Jeffrey pine beetle". Also added a new damage code:

22099 22 089 aspen running canker Neodothiora populina Cankers Any occurrence PNW-AK

Appendix 13. Changed name from "Ownership Prefield Procedures" to "Syncing MIDAS Ownership/ Contact Data Entry with NOMS Database Requirements". There were many changes in this appendix because the procedures underwent a major revision. One change throughout the appendix is that there are now "paired" variables that are collected from owners or from contacts. These variables are found from : A13.11 FIRST NAME OWNER through A13.52.

Appendix 13. The following non-paired variable was added: A13.5 RECORD TYPE.

Appendix 13. The following variables were deleted (original variable numbers): A13.5 INVYEAR, A13.8 OWNER SHORT NAME, A13.9 AGENCY, A13.10 COMPANY, A13.11 MANAGEMNT UNIT, A13.29 DATA SOURCE (CORE OPTIONAL), A13.30 DATA SOURCE OTHER (CORE OPTIONAL), A13.44 OWNERSHIP CONTACT NAME (CORE OPTIONAL), A13.45 OWNERSHIP CONTACT ATTEMPT NUMBER (CORE OPTIONAL), A13.48 LAND POSTED (CORE OPTIONAL), A13.51 ACCESS GRANTED BY (CORE OPTIONAL), A13.55 INFORMATION REQUEST DETAILS (CORE OPTIONAL), and A13.56 INFORMATION REQUEST FULFILLED (CORE OPTIONAL).

Appendix 13. Variable A13.9. The name was changed from "NAME" to "OWNER NAME".

Appendix 13. Variable A13.65. The name was changed from "OWNER NOTES" to "NOTES".

Appendix 13. The examples in section A13.73.1 FIA Ownership Data Recording Examples were revised.

Appendix 14. Updated this appendix for the changes in the species code list (appendix 3) made in version 9.2 of the Master Species Code List.

Glossary

Note: Data items listed as glossary terms are shown in all capital letters (e.g., ACTUAL LENGTH).

Accessible - Can be safely reached and occupied (access denied, Census water, and noncensus water are never accessible).

ACTUAL LENGTH -Record for trees with missing tops (top on live trees is completely detached; top on dead trees is greater than 50 percent detached from the bole, as demonstrated by greater than 50 percent of the bole's circumference (shell) no longer being continuously intact. On live or dead trees, do not include shards that may remain above a broken or missing bole. If the top is intact, this variable may be omitted. Record the ACTUAL LENGTH of the tree to the nearest 1.0 foot from ground level to the break. Use the length to the break for ACTUAL LENGTH until a new leader qualifies as the new top for TOTAL LENGTH; until that occurs, continue to record ACTUAL LENGTH to the break. Trees with previously broken tops are considered recovered (i.e., ACTUAL LENGTH = TOTAL LENGTH) when a new leader (dead or alive) is 1/3 the diameter of the broken top at the point where the top was broken (not where the new leader originates from the trunk).

Agricultural land - Land managed for crops, pasture, or other agricultural use. Evidence includes geometric field and road patterns, fencing, and the traces produced by livestock or mechanized equipment. The area must be at least 1.0 acre in size and *meet the minimum width requirement of* 120.0 feet *to qualify*.

Annular plot - *A* circular ring with a beginning radius of 24.0 feet from subplot center and an ending radius of 58.9 feet.

Area of Observation (AOO) for a condition - The acre portion of the condition that is evaluated to describe the condition class attributes using the following steps:

1. Follow the condition delineation procedures to first determine how many conditions the plot contains.
2. Once this has been completed, determine the shape of the AOO following the procedures below for a Single-, Multi-, or Split-condition plot based on the number of conditions recognized on the plot.
3. Follow the specific guidance associated with each individual condition attribute while describing them within the AOO.

- Single-condition plot: The AOO is defined by the area contained within four, 58.9-ft. radius circles originating from subplot centers, the combined area of which is equal to one acre. Ignore any area within the AOO that contains a condition other than the one located at Plot center (PC). See Figure 5.1.
- Multi-condition plot: The AOO is defined by the nearest acre shape in relation to Plot center (PC) while including all subplots and portions of subplots in the condition being evaluated. See Figure 5.2 and Figure 5.3.
- Split-condition plot: A split condition plot is a special case of a multi-condition plot. A split-condition plot occurs when one condition (condition 2 for example) is split into two or more parts by another condition (condition 1 for example). This results in the need for two or more separate shapes to be created (each proportionally sized to the part of the condition it is representing. Combined, these shapes serve as the AOO. Each shape must include the portion of the subplots in the condition being evaluated, be closest to PC, and remain in the condition being evaluated. Combined, these shapes should equal an acre. There may be situations where this is not always possible. In such cases the goal is to visualize a combined acre represented by the combined area of these shapes within condition 1. See Figure 5.4
- **Nonsampled Conditions**: Nonsampled conditions are treated the same way as sampled conditions with the following exceptions (1) Estimate required condition attributes from the image and (2) If there appears to be multiple adjoined potential CONDITION CLASS STATUS 1 conditions on a plot, all of which are nonsampled, use the Single condition plot AOO design. (3) If a plot contains both CONDITION CLASS STATUS 5 and one or more additional CONDITION CLASS STATUS 2, 3, or 4 conditions, use the multiple-condition plot AOO design. If only one CONDITION CLASS STATUS is to be recorded on the plot, estimate the required condition attributes from the CONDITION CLASS STATUS 5 AOO only and use these to describe the entire plot regardless of the CONDITION CLASS STATUS at the PC.

For conditions that are less than an acre, such as a small developed area, the AOO is defined by the boundaries of the condition itself. In all cases the AOO must remain entirely within the condition being evaluated. Canopy cover checks and TOTAL STEMS counts do not take place within the AOO. They are evaluated within the Canopy cover sample area.

ARTIFICIAL REGENERATION SPECIES - Indicates the predominant species that is planted or seeded in an artificially regenerated condition.

Aspect - Compass direction that a slope faces.

Basal area - The area of a given section of land that is occupied by the cross-section of a tree trunk, or a stem, at its base.

Baseline - A line on an aerial photo used as a datum for further work. When the azimuth and length of the line are known (provided, or determined by taking ground measurements), the orientation and scale of the photo can be determined.

Blind check - *A* re-installation of a production plot done by a qualified crew without production crew data on hand. A full re-installation of the plot is recommended for the purpose of obtaining a measure of uncertainty in the data. All plot-level information (e.g., boundary and condition information) will be collected on each blind check plot. The two data sets are maintained separately. Discrepancies between the two sets of data are not reconciled. Blind checks are done on production plots only.

Board foot - A volume measure of lumber 1-foot wide,1-foot long, and 1 inch thick equal to 144 cubic inches.

Bole - The main stem of a tree, represented by the stem with the most merchantable volume extending from one foot above the ground to the point on the tree where DOB reaches 4 inches. On trees with secondary forks above the diameter measurement point, the bole is represented by the stem with the most merchantable volume. If there is no merchantable volume within any of the potential stems, choose the stem with the most volume that is not rotten cull. Diameter, damages, and all variables that relate to merchantability are evaluated on the bole as are regional TREE CLASS and TREE GRADE protocols. Saplings are evaluated based on a projection of the development of their future 4-inch DOB top. For woodland species there is no defined bole; follow the specific woodland species instructions included in each associated data variable.

Botched plot - A plot that should not be included in the standard inventory data base due to data collection errors or other problems.

Boundary - The intersection of two or more conditions on a subplot, *macroplot, hectare plot*, or microplot. Each boundary is described by recording the azimuth and horizontal distance from the subplot, *macroplot, hectare plot*, or microplot center to the left and right points of where the boundary intersects the perimeter of the *respective fixed-radius plot*. An azimuth and distance to a corner point may also be described, if one exists. If multiple boundaries exist at a subplot, they are recorded in the order of their occurrence on the subplot, starting from north and proceeding around the compass.

Canopy Cover Check - The process used to sample a potential condition to determine if it meets the 10 percent canopy cover threshold needed to be considered Accessible Forest Land. It is required when LIVE PLUS MISSING CANOPY is estimated to be >greater than 5 percent but less than 15 percent. The shape of the condition being evaluated, and regional guidelines determine which of the three CANOPY COVER METHODs (Subplot, Acre, and Sub-acre) are used for the check. In situations where a canopy cover check is not required, the Ocular Method may be used to populate LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER. The Ocular Method estimates the canopy cover over the Area of Observation as opposed to the canopy cover sample area.

Canopy cover sample area - The canopy cover sample area is the area contained within the bounds of the CANOPY COVER SAMPLE METHOD (includes Sub-acre, Acre, Subplot, and their associated phantoms when required) used to complete TOTAL STEMS counts. This area is used to determine LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER when the ocular CANOPY COVER SAMPLE METHOD is not appropriate.

Census water - Rivers, streams, *and canals etc.* that are more than 200 feet wide and *ocean, lakes, reservoirs, ponds, and similar* bodies of water that are greater than 4.5 acres in size.

Certification plot - *A* plot installed by a certification candidate. It may be a training plot or a production plot. The candidate working alone installs the plot.

Chaparral - Areas currently covered or previously covered with heavily branched dwarfed trees or shrubs, usually evergreen, the crown canopy of which covers or previously covered greater than 10 percent of the ground and are expected to recover to chaparral after a disturbance.

Clump - Three or more live hardwood stems, 1.0 inch or greater, originating from a common root system; includes stumps and forks below DBH, but not seedling-sized sprouts or suckers.

Cold check - An inspection of a production plot done either as part of the training process, periodic review of field crew performance, or as part of the ongoing QA/QC program. Normally the installation crew is not present at the time of inspection. The inspector has the completed data in-hand at the time of inspection. The inspection can include the whole plot or a subset of the plot. Cold checks are done on production plots only.

Compaction (soil) - Process by which soil grains are rearranged so as to come into closer contact with one another, resulting in a decrease in void space and an increase in soil bulk density (Helms 1998).

Condition - A discrete combination of forest and/or landscape attributes that describe the environment on all, or part of the plot (when there is more than one delineated area present). These attributes include CONDITION CLASS STATUS, RESERVED STATUS, OWNER GROUP, FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, TREE DENSITY, and when completing nonforest inventories, PRESENT NONFOREST LAND USE. Conditions are defined at the minimum size requirement required for each CONDITION CLASS STATUS (with the exception of 5 specific PRESENT NONFOREST LAND USEs that have no size requirements). The minimum size requirements associated with each of the six delineating variables linked to CONDITION STATUS = 1 (Accessible Forest Land) is 120 feet and 1 acre. The size requirements for PRESENT NONFOREST LAND USE is dependent on the individual land use being evaluated.

Condition class - The combination of discrete attributes that describe the area associated with a plot. These attributes include condition status (land use), forest type, stand origin, stand size, owner group, reserve status, and stand density, as well as other ancillary and computed attributes.

Corporate land - An ownership class of private lands owned by a company, corporation, legal partnership, investment firm, bank, timberland investment management organization (TIMO), or real estate investment trust (REIT).

Crook - Abrupt bend in a tree or log (Helms 1998).

Cropland - Land under cultivation within the past 24 months, including orchards and land in soil improving crops, but excluding land cultivated in developing improved pasture.

CROWN CLASS - A classification of trees based on dominance in relation to adjacent trees within the stand as indicated by crown development and the amount of sunlight received from above and sides.

Cull - Portions of a bole that are unusable for industrial wood products because of rot, form, or other defect.

Cultivar - The international term cultivar denotes an assemblage of cultivated plants that is clearly distinguished by any characters (morphological, physiological, cytological, chemical, or others) and when reproduced (sexually or asexually), retains its distinguishing characters. The term is derived from "cultivated variety," or their etymological equivalents in other languages. For cultivated plants, the term cultivar is the equivalent of a botanical variety, in accordance with the International Code of Nomenclature of Cultivated Plants 1980. Usage: cultivar names are not italicized and are indicated by single quotes at first use, or the word cultivar (but not both). The abbreviation cv. is properly used only with a binomial name: Genus species cv. cultivar name. Omit the abbreviation if single quotes are used: Genus species 'cultivar name'. (National Resources Conservation Service [NRCS] 2010. Title 190 - National Plant Materials Manual: Part 542.1 Glossary of Terms for Use in Plant Materials. 190-V-NPMM, Fourth Edition, July 2010. p. 13. Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/about/handbook/.)

Declination - The azimuth correction used to adjust magnetic north to true north with a compass, measured in degrees.

Defoliation - Premature removal of foliage (Goheen and Willhite 2006).

Diameter at breast *h*eight (DBH) - The diameter of the bole of a tree at breast height (4.5 feet above the ground *on the uphill side of tree*), measured outside of the bark.

Diameter at root *c*ollar (DRC) - The diameter of a tree measured at the ground line or stem root collar, measured outside of the bark.

Diameter *o*utside *b*ark (DOB) - A diameter that may be taken at various points on a tree, or log, **outside** of the bark. Diameter *o*utside *b*ark is often estimated.

<u>**Dieback** - This is recent mortality of branches with fine twigs, which begins at the terminal portion of a branch and proceeds toward the trunk. Dieback is only considered when it occurs in the upper and outer portions of the tree. When whole branches are dead in the upper crown, without obvious signs of damage such as breaks or animal injury, assume that the branches died from the terminal portion of the branch. Dead branches in the lower portion of the live crown are assumed to have died from competition and shading. Dead branches in the lower live crown are not considered as part of crown dieback, unless there is continuous dieback from the upper and outer crown down to those branches. Crown dieback is intended as a measure of recent crown stress.</u>

Disturbance - Any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment (Helms 1998).

Down woody material (DWM) - Dead material on the ground in various stages of decay, including coarse and fine woody material.

Duff - The layer just below litter. It is the soil layer dominated by organic material derived from the decomposition of plant and animal litter and deposited on either an organic or a mineral surface. This layer is distinguished from the litter layer in that the original organic material has undergone sufficient decomposition that the sources of this material (e.g., individual plant parts) can no longer be identified.

Ecological unit - Zones defined in an FIA stockability study that share similar plant species.

FDM - Field Data Manager (also known as Plot Edit Tools) is a Microsoft Access Application which runs on a PC. It is used as a secondary edit of plot data which captures the crew's explanations for errors and warnings found in the data.

<u>**Federal Information Processing Standard (FIPS)** - A unique code identifying U.S. States and counties (or units in Alaska).</u>

<u>**Forest *i*ndustry *l*and** - Land owned by companies or individuals that operate *a primary wood processing* plant.</u>

Forest Service administered lands - Land owned or administered by the Forest Service; includes national forests, national grasslands, wilderness, national scenic areas, etc.

<u>**FOREST TYPE** - A classification of forest land based upon, and named for, the tree *species that forms the plurality of live-tree stocking*.</u>

Forked tree - A tree with a stem that is at least 1/3 the diameter of the main stem, branches out from the main stem at an angle of 45 degrees or less AND must be judged to have, or have the potential to assume an obvious "tree like" form and function as opposed to an obvious "branch like" form and function. Forks originate at the point on the bole where the piths intersect.

Fuelbed - The accumulated mass of dead, woody material on the surface of the forest floor.

<u>**GPS** - Global Positioning System. Information from this system is collected and used to determine the latitude and longitude of each plot.</u>

Graminoid - Grasses (family Gramineae or Poaceae) and grasslike plants such as sedges (family Cyperaceae) and rushes (family Juncaceae).

<u>**Hardwoods** - *Tree species belonging to the botanical subdivision Angiospermae, class* Dicotyledonous, usually broad-leaved and deciduous.</u>

Hazardous - An area that cannot be accessed because of a hazard or danger, for example: cliffs, quarries, strip mines, illegal substance plantations, high water, etc.

Hectare plot - A circular, fixed area plot with a radius of 185.1 feet. Hectare plots are used for sampling very large trees on qualifying federal lands.

Hex number - Previous terminology for "plot number"; hex number equals plot number.

<u>**Hot check** - *A*n inspection normally done as part of the training process. The inspector is present on the plot with the trainee and provides immediate feedback regarding data quality. Data errors are corrected. Hot checks can be done on training plots or production plots.</u>

Hybrid - (1) Offspring of a cross between genetically dissimilar individuals. (2) First-generation progeny resulting from the controlled cross-fertilization between individuals that differ in one or more genes. (National Resources Conservation Service [NRCS] 2010. Title 190 - National Plant Materials Manual: Part 542.1 Glossary of Terms for Use in Plant Materials. 190-V-NPMM, Fourth Edition, July 2010. p. 27. Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/about/handbook/.)

Idle farmland - Former cropland or pasture that has not been tended within the last *two* years and that has less than 10 percent stocking with live trees.

Improved pasture - Land that is currently maintained and used for grazing. Evidence of maintenance, besides the degree of grazing, includes condition of fencing, presence of stock ponds, periodic brush removal, seeding, irrigation, or mowing.

Improved road - Paved roads, gravel roads, or improved dirt roads regularly maintained for longterm continuing use by normal passenger vehicles. Generally constructed using machinery. The area where the original topography has been disturbed by cutbanks and fill is considered part of the road, if that area is maintained. Unimproved traces and roads created for skidding logs are not considered improved roads.

Inclusion - An area that would generally be recognized as a separate condition, except that it is not large enough to qualify on its own. For example, a ½ acre pond within a forested stand or ½ acre of saplings within a pole size stand. The same logic applies in nonforest conditions. For example, a ½-acre pond within rangeland or a ½-acre island of trees within rangeland. This concept extends to ancillary condition level variables in relation to their associated size requirements.

Industrial roundwood - Trees that are capable of growing to size and quality adequate to produce lumber and other manufactured products (exclude fence posts and fuel wood which are not considered manufactured).

Industrial *wood* - All roundwood products, except firewood.

Inspector - A qualified QC/QA individual whose primary responsibility is the training, certification and inspection of production crews.

Islands Only Species (IOS) - Tally species limited to the Islands Sub-list (Caribbean and Pacific islands, including Hawaii). Such species are not valid tally trees on the mainland (continental) United States.

Krummholz - The shrubby, multi-stemmed form assumed by trees near treeline.

Land *area* - As defined by the Bureau of the Census: The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean tide); streams, sloughs, estuaries and canals less than 200 feet in width, and ponds less than 4.5 acres in area.

Litter - Undecomposed or only partially decomposed organic material that can be readily identified. Includes the layer of freshly fallen leaves, needles, twigs (< 0.25 inch in diameter), cones, detached bark chunks, dead moss, dead lichens, detached small chunks of rotted wood, dead herbaceous stems and flower parts (detached and not upright).

Macroplot - A circular, fixed area plot with a radius of 58.9 feet. Macroplots may be used for sampling relatively rare events*, such as large trees or mortality*.

Marsh - Low, wet areas characterized by heavy growth of *herbaceous plants* and grasses and an absence of trees.

Master Species List - All species listed in Appendix D. The master list consists of an Islands and a Mainland Sub-list. There are currently 33 species (FG 9.2) that separate the two and the Mainland Sub-list collapses back into the Islands Sub-list. There is one P2/3 Sub-list within the Islands list and there are nine P2/3 Sub-lists within the Mainland list where specific species can be excluded from P2/3 tally. Currently (FG 9.2) there are no species on the Islands P2/3 Sub-list. After taking into account the Island, Mainland, and P2/3 Sub-lists, these are the species used to define FIA Forest Land. Species not listed are considered shrubs and do not factor into defining FIA Forest. Species listed on a specific P2/3 Sub-list are considered shrubs within the area that the P2/3 Sub-list represents on both P2 and P3 plots, including Down Woody Materials (DWM).

Measure Low Approach – A method of measuring DBH on trees where the following originate at the approximate same location on the bole preventing accurate and repeatable diameter measurement: multiple forks, prolific branching, or a combination of multiple forks and prolific branching. This method is also applied in situations where forked trees are grown together in such a fashion that an accurate and repeatable diameter cannot be measured OR estimated due to the deformation resulting from the presence of the above mentioned criteria. In such cases a single tree is tallied and the diameter is measured at the highest most repeatable location between the 1-foot stump and the initial pith separation.

Measurable nonforest condition class - Nonforest condition classes on Region 5 or Region 6 Forest Service administered lands. Certain data items are recorded in measurable nonforest conditions that are not typically measured in nonforest conditions; these are identified inra the associated "when collected" field for individual data items.

Measurement quality *o*bjective (MQO) - Describes the acceptable tolerance for each data element. MQOs consist of two parts: a statement of the tolerance and a percentage of time when the collected data are required to be within tolerance.

Merchantable *top* - The point on the *tree bole* above which merchantable material cannot be produced. Merchantable top is 1.5 inches for woodland species and 4.0 inches for all other species.

Microplot - A circular, fixed-radius plot with a radius of 6.8 feet that is used to sample trees less than 5.0 inches at DBH/*DRC*, as well as other vegetation *and fuel measurements*. Microplot center is 90 degrees and 12 feet offset from the center of each subplot.

MIDAS - Mobile integrated data acquisition system; the portable data recorder program used by PNW-FIA.

National Forest Region Exclusion (NFS 1, 2, 3, 4, 5, 6, 8, 9, and/or 10) - These species are not valid tally trees on plots within the specified National Forest System Region. However, they are valid on plots that are located within urban areas in that NFS Region.

Native American (Indian) *l*and - Tribal lands held in fee, or trust, by the Federal government but administered for Indian tribal groups and Indian trust allotments. This land is considered "Private Lands", Owner Group 40.

New installation - The initial establishment of the "annual" four-subplot national plot design; includes plots field-visited for the first time (i.e., no ground plot exists) and periodic revisited plots (periodic to annual; annual plot is being established at the periodic plot location).

Noncensus *w*ater - Bodies of water from 1 to 4.5 acresand water courses from 30 feet to 200 feet in width.

Nonforest land - Land that does not support, or has never supported, forests, and lands formerly forested where use for timber management is precluded by development for other uses. Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining rights-of-way, power line clearings of any width, *Census* and noncensus water. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120.0 feet wide, and clearings, etc., more than one acre in size, to qualify as nonforest land.

Non-stocked Forest Land - Non-stocked forest land is based on canopy cover. A condition otherwise meeting the definition of accessible forest land that has less than 10 percent LIVE CANOPY COVER. Conditions with a TOTAL STEMS count greater than or equal to 150 are excluded. This term is not related to STAND SIZE CLASS = Non-stocked, as in this context non-stocked is based on stocking.

Nonstockable - Areas of forest land that are not capable of supporting trees because of the presence of rock, water, etc.

Nonstocked - Timberland less than 10 percent stocked with live trees. Recent clearcuts scheduled for planting are classified as nonstocked area.

Other federal lands - Federal land other than *Forest Service administered lands*. These include lands administered by the USDI Bureau of Land Management, USDI National Park Service, USDI Fish and Wildlife Service, Department of Defense, Department of Energy, Army Corps of Engineers, and military bases.

OWNER CLASS - A *classification* that *divides* land into fine categories of ownership.

OWNER GROUP - A *classification* that *divides* land into broad categories of ownership*:* Forest Service, Other Federal Agency, State and Local Government, and Private. Differing categories of Owner Group on a plot require different conditions.

Ownership - A legal entity having an ownership interest in land, regardless of the number of people involved. An ownership may be an individual; a combination of persons; a legal entity such as corporation, partnership, club, or trust; or a public agency. An ownership has control of a parcel or group of parcels of land (USDA Forest Service 2006).

Pathogen - Parasitic organism directly capable of causing disease (Helms 1998).

PDR - Portable data recorder.

Perennating - To survive from one growing season to the next, often with a period of reduced or arrested growth between seasons.

P2/3 Sub-lists - These lists exclude specific species from tally on P2/3 plot types.

- Islands P2/3 Sub-list - covers all the Pacific and Caribbean Islands.
- National Forest System Regional Boundary Sub-list (NFS 1, 2, 3, 4, 5, 6, 8, 9, and/or 10) - covers all lands (public or private) within the boundaries of each of the 9 NFS Regions

Phase 1 (P1) - FIA activities done as part of remote-sensing and/or aerial photography.

Phase 2 (P2) - FIA activities done on the network of ground plots formerly known as FIA plots.

Phase 3 (P3) - FIA activities done on a subset of Phase 2 plots formerly known as Forest Health Monitoring plots. Additional ecological indicator information is collected from Phase 3 plots.

Plot - A cluster of four subplots that samples approximately 1/6 acre. The subplots are established so that subplot 1 is centered within the sample and the centers of subplots 2, 3, and 4 are located 120.0 feet from the center of subplot 1 at azimuths of 360, 120, and 240 degrees, respectively. Each subplot has an associated microplot and macroplot. Throughout this field guide the use of the word 'plot' refers to the entire set of four subplots. This is the area that determines which conditions are tallied on the plot during the condition delineation process.

Plot area - The plot area is the area contained within the 4 subplots/macroplots. This is the area that determines which conditions are tallied on the plot during the condition delineation process.

Plot card - A paper form, included in each plot jacket, containing the following information: plot number; state; county; date; crew leader name; crew member name(s); plot diagram.; plot access sketch map; and boundary mapping/plot diagram.

Plurality - An amount or group (as of stocking points) that is greater than any other amount or group within a total but that is not necessarily a majority (more than half).

PRIVATE OWNER INDUSTRIAL STATUS - Indicates whether Private land owners own and operate a wood processing plant.

Production crew - *A* crew containing at least one certified individual. The crew is involved in routine installation *and measurement* of plots.

Production plot - A plot measured by a production crew. These plots may also be used for training purposes.

Reference plot (off grid) - A plot that is used for crew certification. These plots are NOT included in the ongoing inventory process and data from these plots do not become part of the standard inventory database. To ensure that these plots do not enter into the inventory database, they are assigned plot numbers outside the normal range of production plots or other invalid plot identification information such as an invalid STATE code (STATECD).

REGENERATION STATUS - A stand descriptor that indicates whether a stand has been naturally or artificially regenerated.

RESERVED STATUS - An indication of whether the land in a condition has been reserved.

Sapling - *A* tree 1.0 to 4.9 inches DBH.

Seedling - Conifer seedlings must be at least 6.0 inches in length and less than 1.0 inch at DBH/DRC in order to qualify for tallying. Hardwood seedlings must be at least 12.0 inches in length and less than 1.0 inch at DBH/DRC in order to qualify for tallying. For woodland species, each stem on a single tree must be less than 1.0 inch in DRC.

Senescence - The life phase of an organism or a part of the organism that precedes natural death, usually involving a decreased ability to repair damage and degradation. For plants, this is when the current season's growth (foliage) begins to fade before dormancy, or death for annuals.

Site index - The average total height that dominant and co-dominant trees in fully stocked, even-aged stands will obtain at key ages, as determined by an equation.

Slope - Measure of change in surface value over distance, expressed as a percentage (Helms 1998).

Softwoods - Coniferous trees, usually evergreen having needles or scale-like leaves.

Snag - A standing dead tree that must be at least 5.0 inches in diameter(DBH or DRC), have a bole which has an unbroken ACTUAL LENGTH of at least 4.5 feet(DBH species) or 1.0 feet (DRC species with single stems), and lean less than 45 degrees from vertical as measured from the base of the tree to the point of diameter measurement.

Stand - A contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit (The Dictionary of Forestry John A Helms 1998). Although this term is used in its generic sense throughout the field guide this term is specific to the plurality of all live trees, saplings and seedlings that are not overtopped within the Area of Observation when associated with describing a condition. For example, STAND SIZE CLASS and STAND AGE are specific to the portion of a stand that is within the Area of Observation used to describe the condition.

STAND AGE - A stand descriptor that indicates the average age of the live trees not overtopped in the predominant stand size-class of a condition.

Standing dead tree - A dead tree that must be at least 5.0 inches in diameter (DBH or DRC), have a bole which has an unbroken ACTUAL LENGTH of at least 4.5 feet (DBH species) or 1.0 feet (DRC species with single stems), and lean less than 45 degrees from vertical as measured from the base of the tree to the point of diameter measurement.

STAND SIZE - A stand descriptor that indicates which size-class of trees constitutes the majorit of stocking in the stand.

State, county and municipal ands - Lands owned by states, counties, and local public agencies or municipalities, or lands leased to these government units for 50 years or more.

Stocking - The relative degree of occupancy *of* land by trees, measured as basal area or the number of trees in a stand by size or age and spacing, compared to the basal area or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

Subplot - A circular, fixed-area plot with a radius of 24.0 feet. Each subplot represents ¼ of the fixed plot sample unit.

Subplot-condition - The portion of a condition that is located within a subplot.

Subspecies - A grouping within a species used to describe geographically isolated variants, a category above "variety," and is indicated by the abbreviation "ssp." in the scientific name (Natural Resource Conservation Service (NRCS) PLANTS Database September 15, 2017 version maintained by the Forest Inventory and Analysis Information management group as database table REF_PLANT_DICTIONARY [USDA, NRCS. September 15, 2017. The Plants Database. http://plants.usda.gov/plants. National Plant Data Center, Baton Rouge, LA 70874-4490])

TOTAL LENGTH - The total length of the bole, recorded to the nearest 1.0 foot from ground level up past the 4-inch top to the tip of the apical meristem. For trees growing on a slope, measure on the uphill side of the tree. If the tree has a broken or missing top, the TOTAL LENGTH is estimated to what the length would be if there were no missing or broken top. TOTAL LENGTH on multi-stemmed woodland species is based on the length of the longest stem present.

Training (practice) plot - A plot established for training or certification purposes only. It is NOT a plot in the ongoing inventory process and data from these plots do not become part of the standard inventory data base. To ensure that these plots do not enter into the inventory data base, they are assigned plot numbers outside the normal range of production plots or other invalid plot identification information such as an invalid STATE code (STATECD).

Transect - A narrow sample strip or a measured line laid out through vegetation chosen for study (Helms 1998).

Transition *zone* - An area where a distinct boundary between two or more different conditions cannot be determined.

Tree (FIA definition) - All species on the Master Species List. In FIA, a tree is defined as any plant on the tree list in the current field manual. When deciding whether to add or remove species from the tree list, species form is taken into account and a tree is generally described as a woody perennial plant, typically large, with a single well-defined stem carrying a more or less definite crown, sometimes defined as attaining a minimum diameter of 3.0 inches (7.6 cm) and a minimum height of 15 feet (4.6 m) at maturity.

Urban areas - These are census defined areas with a population density of 500 people per square mile associated with a town or city with a population of at least 2,500. Within these areas there is the potential for an Urban plot type and a P2/3 plot type to be coincident. In these cases, the P2/3 plot type will be measured using the P2/3 field guides and the Urban plot type will be measured using the Urban field guide.***TREE* DENSITY** - A stand descriptor that indicates the relative tree density of a condition class. The classification is based on the number of stems/unit area, basal area, tree cover, or stocking of all live trees in the condition which are not overtopped, compared to any *other* condition class tree density *recorded on the plot*.

Variety - (1a) The botanical nomenclature division consisting of more or less recognizable entities within a species that are not genetically isolated from each other, below the level of subspecies, and is indicated by the abbreviation "var." in the scientific name (see "botanical variety"); (1b) The rank of taxa below subspecies but above forma; a plant which retains most of the characteristics of the species, but differs in some way such as flower or leaf color, size of mature plant, etc. A variety is added to the specific binomial and preceded by "var.," such as saxatilis in the epithet Juniperus communis var. saxatilis. (2) Term used in some national and international legislation to denominate one clearly distinguishable taxon from another; equivalent to "cultivar." (Note: the PMP does not recognize the terms "variety" and "cultivar" as equivalent.). (National Resources Conservation Service [NRCS] 2010. Title 190 - National Plant Materials Manual: Part 542.1 Glossary of Terms for Use in Plant Materials. 190-V-NPMM, Fourth Edition, July 2010. p. 54. Available online:https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/about/handbook/.)