PNW-FIADB Users Manual

A data dictionary and user guide for the PNW-FIADB database

The Pacific Northwest Forest Inventory and Analysis Database

Annual Inventory Data

California, Oregon, and Washington

2001 – 2014

The database includes data for:

Current estimates for the most recent 10 years: 2005 to 2014
and
Estimates of Down Woody Materials for the first protocol:
Oregon and California – 2001 to 2010 data;
Washington – 2002 to 2011
and
Data on remeasured plots for
California, Oregon, Washington

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Documentation is based on the National FIADB manual Version 5.1.6

A customized version of the national FIADB Manual
for the Pacific Northwest FIA program

Foreword

Forest Inventory and Analysis (FIA) is a continuing endeavor mandated by Congress in the Forest and Rangeland Renewable Resources Planning Act of 1974 and the McSweeney-McNary Forest Research Act of 1928. FIA's primary objective is to determine the extent, condition, volume, growth, and depletions of timber on the Nation's forest land. Before 2000, all inventories were conducted on a periodic basis. With the passage of the 1998 Farm Bill, FIA is required to collect data on plots annually within each State. This kind of up-to-date information is essential to frame realistic forest policies and programs. USDA Forest Service regional research stations are responsible for conducting these inventories and publishing summary reports for individual States.

In addition to published reports, the Forest Service provides data collected in each inventory to those interested in further analysis. This data dictionary describes a standard format in which data can be obtained. Annual inventories use a common plot design and common data collection procedures nationwide, resulting in greater consistency among FIA units than earlier inventories. Data field definitions note inconsistencies caused by different sampling designs and processing methods among states and regions.

The PNW-FIADB is a customization of the national database structure. It contains annual inventory data collected and compiled with national protocol and algorithms, as well as regional data that are collected only by the PNW FIA program. Data columns that do not pertain to the PNW have been deleted from each table. And, columns are reorganized and sorted by name to make it easier to find an individual column. The 'CN' columns have been moved to the top of each table, along with other frequently used columns.

The PNW FIA program hopes this customized version of FIADB will simplify the use of the extensive FIA data available for Alaska, California, Oregon, and Washington inventories.

Inventory data for Phase 2 field plots in this database:

	Current Estimates	DWM Estimates	Remeasured plots
California	2005-2014	2001-2010	2001-2003 to 2011-2014
Oregon	2005-2014	2001-2010	2001-2003 to 2011-2014
Washington	2005-2014	2002-2011	2002-2003 to 2012-2014

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Although we have reviewed the data and documentation extensively, if you find any errors, typos, or other problems with anything in the PNW-FIADB package, we would appreciate it if you would let us know.

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Chapter 1 -- Introduction

This manual is a guide to the PNW version of the national Forest Inventory and Analysis Database (FIADB). The Pacific Northwest FIA work-unit has created a regional version of the database, **called PNW-FIADB**, along with a regional version of the documentation. Both the database and documentation are based on the national products, but customized to reflect data relevant to the four PNW states: Alaska, California, Oregon, and Washington. The national database is documented in the publication *The Forest Inventory and Analysis Database: Database Description and Users Manual Version 4.0 for Phase 2 (RMRS-GTR-245, 2011)* which is updated regularly (latest is Version 5.1.6). This is the source of the majority of text found in the pages that follow. The PNW-FIADB includes all the core data required by the national FIA program, along with a variety of data items that have been collected locally by the PNW work-unit (sometimes referred to as 'regional add-ons'). In addition, this database only retains columns within a table that are relevant to the current annual PNW inventory. In contrast, the national FIADB contains a wide variety of columns, some of which pertain only to other FIA work units (Northern, Southern, or Interior West units) and are null (blank) for all PNW states. To improve the utility of the database for users interested only in PNW states, these non-PNW columns have been excluded from the PNW-FIADB database. And, to help users find data quickly, most columns have been sorted by name within a given table.

Although it is used widely within the Forest Inventory and Analysis (FIA) program, a substantial part, if not the majority, of the intended audience includes those outside FIA who are interested in using FIA data for their own analyses. It is important that users understand not only the data definitions and acquisition methods, but also the context in which the data were collected. Users are encouraged to read the PNW Field Manuals (available on the PNW-FIADB CD) to become familiar with the protocol used to collect FIA data on the field plot.

This manual has four chapters. The remainder of chapter 1 includes general introductions to the FIA program and the FIA database, including brief histories of both. It provides a convenient overview for those who have an interest in using FIA data, but have not yet become familiar with the FIA program. Chapter 2 provides descriptions of FIA sampling methods, including plot location and design, data measurement and computation, and general estimation procedures. Chapter 3 describes the tables that comprise the database, the attributes stored in each table, and the linkages between tables. Descriptions of the attributes, their data format, valid values, and other important details are given, but the appropriate field manuals should be consulted for exact specifications regarding data collection methods. Users with a good understanding of chapter 3 and fundamental database management skills should be able to conduct a wide range of analyses. Chapter 4 explains the standard methods used to compile population-level estimates from FIADB. This chapter applies the new estimation procedures documented by Bechtold and Patterson (2005). These procedures are based on adoption of the annual inventory system and the mapped plot design, and constitute a major change when compared to previous compilation procedures. However, the new compilation procedures should allow more flexible analyses, especially as additional panels are completed under the annual inventory system.

There are several conventions used in this manual. The names of attributes (i.e., columns within tables) and table names appear in capital letters (e.g., PLOT table). Some attribute names appear in two or more tables. In most cases, such as the State code (STATECD), the attribute has the same definition in all tables. However, there are situations where attributes with the same name are defined differently in each table. One such example is the VALUE attribute in the REF_FOREST_TYPE table, which is used to identify the forest type and refers to appendix D. However, the VALUE attribute in the REF_UNIT table is used to indicate the FIA survey unit identification number from appendix C. In most cases, such as in the table descriptions in chapter 3, the attribute name will be used alone and the affiliation with a particular table is implied by the context. In cases where an attribute name has a different meaning in two or more tables, a compound naming convention, using the table name followed by the attribute name, will be used. In the VALUE attribute example, the name REF_FOREST_TYPE.VALUE refers to the VALUE attribute in the REF_FOREST_TYPE table, while REF_UNIT.VALUE refers to the VALUE attribute in the REF_UNIT table.

Features unique to the PNW-FIADB (compared to the National FIADB)

The PNW-FIADB contains most of the database tables found in the National FIADB and tables that are unique to PNW. These PNW tables contain regionally collected data (i.e. DWM and understory vegetation), regional calculations (i.e. total stem volume and Scribner volume), regional expansion factors and adjustment factors, simplified organization of national data, and crosswalk tables to translate codes to readable text.

Tables unique to the PNW-FIADB:

PLOT_PNW
PLOT_PNW_2010
COND_PNW
SUBPLOT_PNW
TREE_PNW

VEG_SP_PNWRS
VEG_SP_CONDSUM
VEG_LIFEFORM_CONDSUM

Crosswalk tables:

zPNWREF_AGENTCD
zPNWREF_CNTY_SU_HALFSTATE_NAMES
zPNWREF_COND_STATUS_CD
zPNWREF_Damage_agents
zPNWREF_Damage_severity_codes
zPNWREF_DAMAGE_TYPES
zPNWREF_DIAM_CLASS
zPNWREF_Disturbance
zPNWREF_Ecosubregion_names
zPNWREF_LandStatusCodes_for_CONDPNW
zPNWREF_NFS_NAMES
zPNWREF_OWNER_CLASSES
zPNWREF_OWNGRPCD
zPNWREF_PRESNFCD
zPNWREF_SITE_CLASS
zPNWREF_STAND_AGE_CLASSES
zPNWREF_STANDSIZE
zPNWREF_STATE_NAMES
zPNWREF_Treatment_disturbances

The FIA Program

The FIA program is mandated by Congress in the Forest and Rangeland Renewable Resources Planning Act of 1974 and the McSweeney-McNary Forest Research Act of 1928. The mission of FIA is to determine the extent, condition, volume, growth, and depletions of timber on the Nation's forest land. FIA is the only program that collects, publishes, and analyzes data from all ownerships of forest land in the United States (Smith 2002). Throughout the 80-year history of the program, inventories have been conducted by a number of geographically dispersed FIA work units. Currently, the national FIA program is implemented by four regionally distributed units that are coordinated by a National Office in Washington, DC (fig.1). The four FIA work units are named by the Research Station in which they reside. Station abbreviations are used within this document and they are defined as Pacific Northwest Research Station (PNWRS), Northern Research Station (NRS), Rocky Mountain Research Station (RMRS), and Southern Research Station (SRS). NRS was recently formed from the merger of North Central Research Station (NCRS) and Northeastern Research Station (NERS). Some data items still retain these designations.

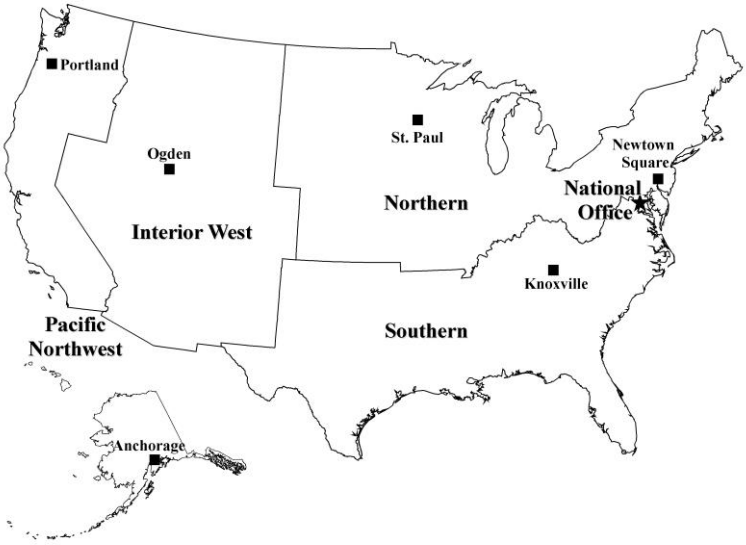


Figure 1. Boundaries of the four regionally distributed FIA work units and locations of program offices.

Starting in 1929, FIA accomplished its mission by conducting periodic forest inventories on a State-by-State basis. Repeat intervals for inventorying individual States have varied widely. By the late 1990s, most States had been inventoried more than once under the periodic inventory system; however not all periodic data are available in electronic form.

With the passage of the 1998 Farm Bill, the FIA program was required to move from a periodic inventory to an annualized system, with a fraction of all plots within a State measured each year (Gillespie 1999). Starting in 1999, States were phased into the annual inventory system (appendix I). At the time of publication of this document, annual inventory has not yet been started in Nevada, Wyoming, and Interior Alaska. Although the 1998 Farm Bill specified that 20 percent of the plots within each State would be visited annually, in the PNW, funding limitations have resulted in a system that samples only 10 percent of the plots in a state each year.

Background on the National FIA Database

The Forest Inventory and Analysis Database (FIADB) was developed to provide users with data in a consistent format, spanning all States and inventories. The first version of FIADB replaced two FIA regional databases, one for the Eastern States (Eastwide database) and the other for the Western States (Westwide database), which were documented previously by Hansen and others (1992) and Woudenberg and Farrenkopf (1995), respectively. A new national plot design (see chapter 2) provided the impetus for replacing these two databases. FIA units adopted this design in all State inventories initiated after 1998. FIADB table structure is currently derived from the National Information Management System (NIMS), which was designed to process and store annual inventory data.

Annual inventories use a nationally standardized plot design and common data collection procedures. While this resulted in greater consistency among FIA units than earlier inventories, some changes in methodology and attribute definitions have been implemented after the new design was put into practice, as part of a continuing effort to improve the inventory. Beginning in 1998, FIA started using a National Field Guide referenced as Field Guide 1.0. The database contains an attribute labeled MANUAL that stores the version number of the field guide under which the data were collected. When both the plot design is coded as being the national design (PLOT.DESIGNCD = 1) and the field guide is coded with a number greater than or equal to 1, certain attributes are defined as being "core" while others are allowed to be "core optional". Core attributes must be collected by every FIA work unit, using the same definition and set of codes. In contrast, collection of core optional attributes are decided upon by individual FIA work units, using the same national protocol, predefined definition, and set of codes. Many attributes, regardless of whether or not they are core or core optional, are only populated for forested conditions, and are blank for other conditions (such as nonforest or water). The PNW-FIADB also contains data collected only on PNW phase 2 plots, such as down woody materials and understory vegetation.

For each attribute in the current version of FIADB, an effort has been made to provide the current definition of the attribute, as well as any variations in definition that may have been used among various FIA work units. In other words, although inventory data have been made available in a common data format, users should be aware of differences that might affect their analyses.

Biomass and carbon information in the FIADB: FIA adopted a standard methodology to compute biomass of various tree components, which are then converted to carbon estimates. This method is called the Component Ratio Method or CRM for short, and is based on average ratios applied to tree stem biomass to approximate the biomass in various components of the tree. Previously, biomass was estimated using a variety of regional or local equations, but these were not always available in every state in the country. PNW states do have a complete set of regional equations that estimate total stem wood, merchantable stem, bark, and branches and consider these equations to be more appropriate and accurate than the average ratio equations used at the national level. Total aboveground biomass and merchantable stem biomass are stored in the table called TREE_REGIONAL_BIOMASS. Users can choose which method they prefer, and can make comparisons between the estimates derived from the different methodologies.

Modeled condition level carbon attributes have been added to the FIADB and can be used to obtain results similar to those found in the U.S. Environmental Protection Agency's (EPA's) Greenhouse Gas Inventory (http://epa.gov/climatechange/emissions/). Note that these estimates are not the accumulated sums of measured data found in the database tables (for trees or DWM).

Specifically, modeled estimates stored on the COND table include: CARBON_LITTER, CARBON_SOIL_ORG, CARBON_UNDERSTORY_AG, CARBON_UNDERSTORY_BG. These estimates can be combined with CARBON_AG and CARBON_BG found on the TREE table, which are a combination of modeled and calculated estimates for live and dead trees. The DWM_COND_DWM_CALC table contains carbon estimates for down woody materials calculated from measured data on phase 2 field plots.

Chapter 2 -- FIA Sampling and Estimation Procedures

To use the FIADB effectively, users should acquire a basic understanding of FIA sampling and estimation procedures. Generally described, FIA uses what may be characterized as a three-phase sampling scheme. Phase 1 (P1) is used for stratification, while phase 2 (P2) consists of plots that are visited or photo-interpreted. A subset of phase 2 plots are designated as phase 3 (P3) plots, where additional health indicator attributes are collected. Phases 1 and 2 are described in this chapter.

Sampling and Post-Stratification Methodology

Remote Sensing (P1)

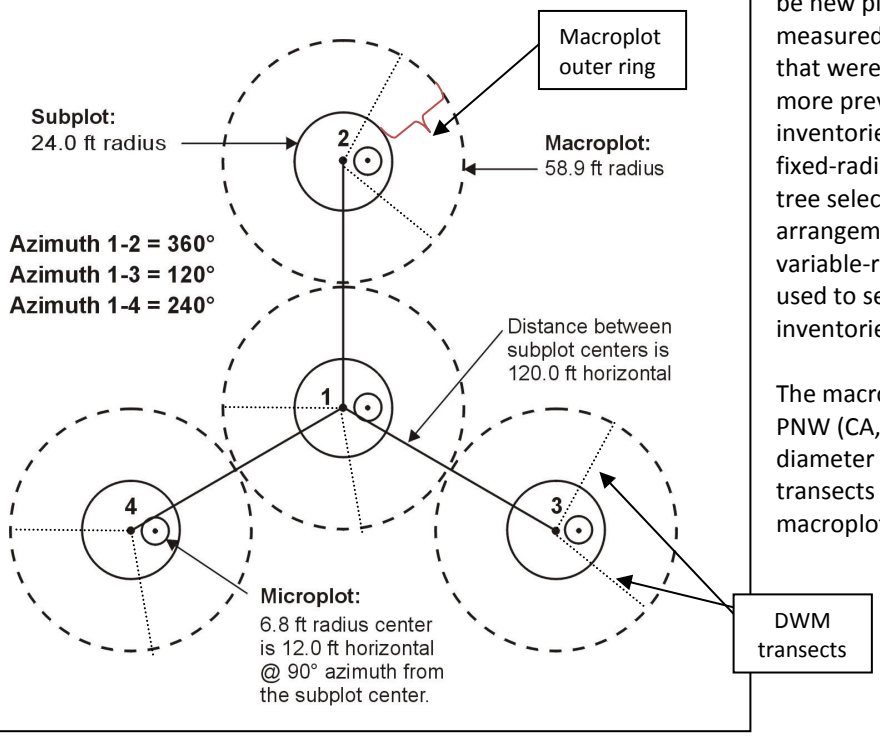
The basic level of inventory in the FIA program is the State, which begins with the interpretation of a remotely sensed sample, referred to as phase 1 (P1). The intent of P1 is to classify the land into various remote sensing classes for the purpose of developing meaningful strata. A stratum is a group of plots that have the same or similar remote sensing classifications. Stratification is a statistical technique used by FIA to aggregate phase 2 ground samples (see below) into groups to reduce variance when stratified estimation methods are used. The total area of the estimation unit is assumed to be known.

Each phase 2 ground plot is assigned to a stratum and the weight of the stratum is based on the proportion of the stratum within the estimation unit. Estimates of population totals are then based on the sum of the product of the known total area, the stratum weight, and the mean of the plot level attribute of interest for each stratum. The expansion factor for each stratum within the estimation unit is the product of the known total area and the stratum weight divided by the number of phase 2 plots in the stratum.

Selection criteria for remote sensing classes and computation of area expansion factors differ from State to State. Users interested in the details of how these expansion factors are assigned to ground plots for a particular State should contact the appropriate FIA unit.

Ground Sampling (P2)

Figure 2. The FIA mapped plot design. Subplot 1 is the center of the cluster with subplots 2, 3, and 4 located 120 feet away at azimuths of 360°, 120°, and 240°, respectively.



FIA ground plots, or phase 2 plots, are designed to cover a 1-acre sample area; however, not all trees on the acre are measured. Ground plots may be new plots that have never been measured, or re-measurement plots that were measured during one or more previous inventories. Recent inventories use a nationally standard, fixed-radius plot layout for sample tree selection (fig. 2). Various arrangements of fixed-radius and variable-radius (prism) subplots were used to select sample trees in older inventories.

The macroplot outer ring is used by PNW (CA, OR, WA) to sample larger diameter trees. PNW also installs transects to sample DWM on the macroplot.

Plot Location

The FIADB includes coordinates for every plot location in the database, whether it is forested or not, but these are not the precise location of the plot centers. In an amendment to the Food Security Act of 1985 (reference 7 USC 2276 § 1770), Congress directed FIA to ensure the privacy of private landowners. Exact plot coordinates could be used in conjunction with other publicly available data to link plot data to specific landowners, in violation of requirements set by Congress. In addition to the issue of private landowner privacy, the FIA program had concerns about plot integrity and vandalism of plot locations on public lands. A revised policy has been implemented and methods for making approximate coordinates available for all plots have been developed. These methods are collectively known as "fuzzing and swapping" (Lister and others 2005).

In the past, FIA provided approximate coordinates for its periodic data in the FIADB. These coordinates were within 1.0 mile of the exact plot location (this is called fuzzing). However, because some private individuals own extensive amounts of land in certain counties, the data could still be linked to these owners. In order to maintain the privacy requirements specified in the amendments to the Food Security Act of 1985, up to 20 percent of the private plot coordinates are swapped with another similar private plot within the same county (this is called swapping). This method creates sufficient uncertainty at the scale of the individual landowner such that privacy requirements are met. It also ensures that county summaries and any breakdowns by categories, such as ownership class, will be the same as when using the true plot locations. This is because only the coordinates of the plot are swapped – all the other plot characteristics remain the same. The only difference will occur when users want to subdivide a county using a polygon. Even then, results will be similar because swapped plots are chosen to be similar based on attributes such as forest type, stand-size class, latitude, and longitude (each FIA unit has chosen its own attributes for defining similarity).

For plot data collected under the current plot design, plot numbers are reassigned to sever the link to other coordinates stored in the FIADB prior to the change in the law. Private plots are also swapped using the method described above – remeasured plots are swapped independently of the periodic data. All plot coordinates are fuzzed, but less than before – within 0.5 miles for most plots and up to 1.0 miles on a small subset of them. This was done to make it difficult to locate the plot on the ground, while maintaining a good correlation between the plot data and map-based characteristics.

For most user applications, such as woodbasket analyses and estimates of other large areas, fuzzed and swapped coordinates provide a sufficient level of accuracy. However, some FIA customers require more precision of plot locations in order to perform analyses by user-defined polygons and for relating FIA plot data to other map-based information, such as soils maps and satellite imagery. In order to accommodate this need, FIA provides spatial data services that allow most of the desired analyses while meeting privacy requirements. The possibilities and limitations for these types of analyses are case-specific, so interested users should contact their local FIA work unit for more information.

Plot Design, Condition Delineation, and Types of Data Attributes

Plot Designs

The current national standard FIA plot design was originally developed for the Forest Health Monitoring program (Riitters and others 1991). It was adopted by FIA and used for all annual inventories. The standard plot consists of four 24.0-foot radius subplots (approximately 0.0415 or 1/24 acre), on which trees 5.0 inches and greater in diameter are measured (fig. 2). Within each of these subplots is nested a 6.8-foot radius microplot (approximately 1/300th acre), on which trees smaller than 5.0 inches in diameter are measured.

Alaska is the only state in the PNW that uses the standard 24-foot radius subplot in their inventory. For California, Oregon, and Washington, the PNW uses a core-optional variant of the standard design, which includes four "macroplots", each with a radius of 58.9 feet (approximately 1/4 acre) that originate at the centers of the 24.0-foot radius subplots. Breakpoint diameters between the 24-foot radius subplots and the macroplots vary and are specified in the macroplot breakpoint diameter attribute called MACRO_BREAKPOINT_DIA in the PLOT table. Only trees that are greater than or equal to this diameter are measured within the ring that surrounds the subplot. See the section below on "Expansion Factors" for more information on the actual diameter limits used for each state.

Conditions

An important distinguishing feature between the current plot design and previous designs is that different conditions are "mapped" on the current design (fig. 3). In older plot designs, adjustments were made to the location of the plot center or the subplots were rearranged such that the entire plot sampled a single condition. In the new design, the plot location and orientation remains fixed, but boundaries between conditions are mapped and recorded. Conditions are defined by changes in land use or changes in vegetation that occur along more-or-less distinct boundaries. Reserved status, owner group, forest type, stand-size class, regeneration status, and stand density are used to define forest conditions. For example, the subplots may cover forest and nonforest areas, or it may cover a single forested area that can be partitioned into two or more distinct stands. Although mapping is used to separate forest and nonforest conditions, different nonforest conditions occurring on a plot are not mapped during initial plot establishment. Each condition occurring on the plot is assigned a condition proportion, and all conditions on a plot add up to 1.0. For unmapped plot designs, condition proportion is always equal to 1.0 in FIADB.

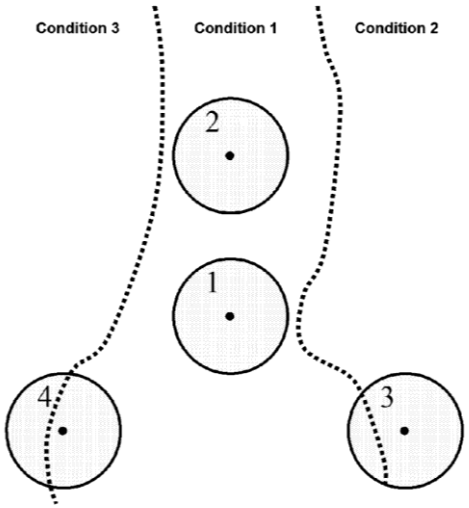


Figure 3. The FIA mapped plot design. Subplot 1 is the center of the cluster with subplots 2, 3, and 4 located 120 feet away at azimuths of 360°, 120°, and 240°, respectively. When a plot straddles two or more conditions, the plot area is divided by condition.

Types of Attributes

Measured, Assigned, and Computed Attributes

In addition to attributes that are collected in the field, FIADB includes attributes that are populated in the office. Examples of field attributes include tree diameter and height, and slope and aspect of the plot and subplot. Attributes that are populated in the office include assigned attributes, such as county and owner group codes, or computed attributes, such as tree and area expansion factors, and tree volumes.

For measured attributes, this document provides only basic information on the methodology used in the field. The authoritative source for methodology is the PNW Forest Inventory and Analysis Field Guide for the year of the inventory (see the 'Field Manual' folder that accompanies the database on CD for PDF copies of all PNW field manuals). The MANUAL attribute in the PLOT table documents the version number where data collection protocols can be found.

Values of attributes that are assigned in the office are determined in several ways, depending on the attribute. For example, ownership may be determined using geographic data or local government records. Other attributes, such as Congressional District and Ecological Subsection are assigned values based on data management needs.

Some computed attributes in the database are derived using other attributes in the database. Ordinarily, such attributes would not be included in a database table because they could be computed using the supplied attributes. However, some data compilation routines are complex or vary within or among FIA work units, so these computed attributes are populated for the convenience of database users.

One example of a computed attribute is site index, which is computed at the condition level. Site index is generally a function of height and age, although other attributes may be used in conjunction. In addition, several different site index equations may be available for a species within its range. Height and age data are included in the TREE table, but only certain trees (see SITETREE table) are included in the site index attribute that is reported for the condition. As a result, it would be time-consuming for users to replicate the process required to calculate site index at the condition level. For convenience, the condition (COND) table includes site index (SICOND), the species for which it is calculated (SISP), and the site index base age (SIBASE).

In most cases computed attributes should be sufficient for users' needs, because the equations and algorithms used to compute them have been determined by the FIA program to be the best available for the plot location. However, for most computed attributes the relevant tree and plot level attributes used to compute them are included in the database, so users may do their own calculations if desired.

Expansion factors

Tree Expansion Factors

The expansion factor(s) used to scale each tree on a plot to a per-acre basis is dependent on the plot design. All unadjusted trees-per-acre values must be adjusted by the factors found in the POP_STRATUM tables before developing population estimates for trees (ie total volume or biomass).

For fixed-plot designs, scaling is straightforward, with the number of trees per acre (TPA) represented by one tree equal to the inverse of the plot area in acres. The general formula is shown by equation [1]:

[1] TPA = 1/(N*A) Where N is the number of subplots, and
A is the area of each subplot.

This tree expansion factor is stored in the **TPA_UNADJ** column in the TREE table (see chapter 3).

The PNW FIA annual inventory has three plots sizes:

Plot Size	Radius in feet	Area per plot	Tree sizes (DIA) measured per plot
Microplot	6.8	.003334877	1" to 4.9"
Subplot	24	.04154172	>= 5"
Macroplot	58.9	.250203045	>= 5" up to 24'; then >= MACRO_ BREAKPOINT_DIA from 24' to 58.9'

1. The TPA for trees measured on the small **Microplot** (DIA < 5.0 inches) is calculated using the equation:

   TPA_UNADJ = 1/(4*0. 003334877) = **74.965282**

2. The TPA for trees measured on the **Subplot** (DIA >= 5.0 inches up to the MACRO_ BREAKPOINT_DIA) is calculated using the equation:

   TPA _UNADJ= 1/(4*0.04154172) = **6.018046**

   Note that if the inventory design uses only the **Subplot** to measure large trees and not the full Macroplot, the TPA of every tally tree ≥5.0 inches DIA uses the equation above. This is the situation for Alaska and a few eastern Oregon plots -- identified by COND.PROP_BASIS="SUBP".

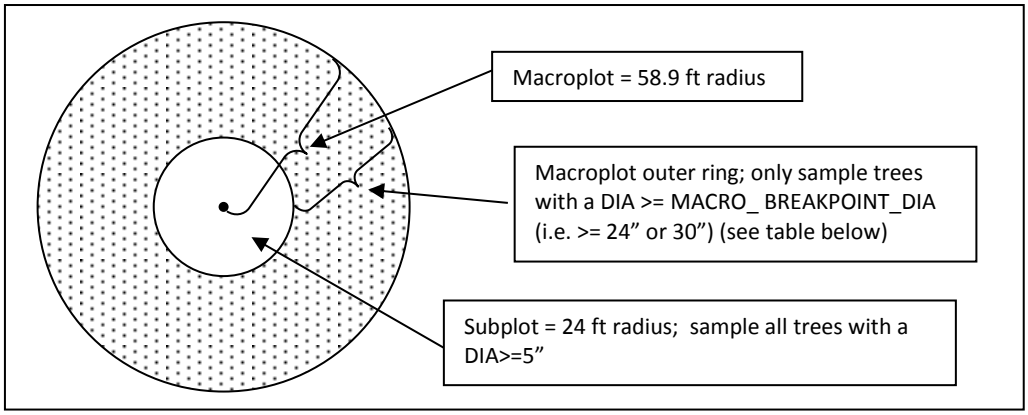
3. The PNW uses the **Macroplot** *(outer ring)* to sample large trees in California, Washington, and most of Oregon; these plots and conditions are identified by the column COND.PROP_BASIS="MACR". We use a set of breakpoint diameters to determine what size trees to tally within the ring between the subplot and macroplot. This affects the way we calculate TPA for larger trees in the inventory.

   When COND.PROP_BASIS = "MACR" :
   all trees with a DIA >= 24" in California, eastern Oregon, and eastern Washington,
   -or-
   all trees with a DIA >= 30" in western Oregon and western Washington,

   Use this equation to calculate TPA:

   TPA _UNADJ= 1/(4*0. 250203045) = **. 999188**

The diagram below illustrates the subplot and macroplot and the range of trees sampled within.

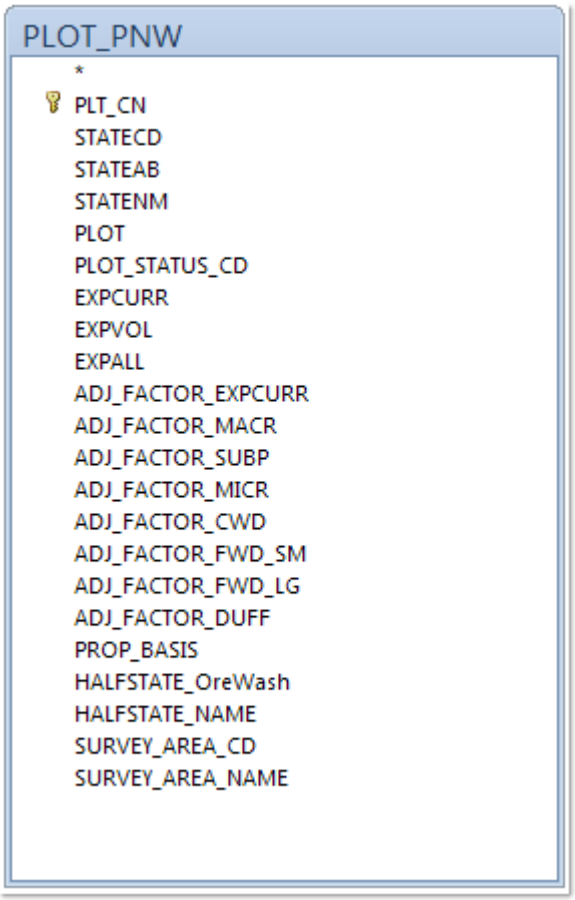


A summary of the MACRO_ BREAKPOINT_DIA limits by state are shown below (not valid in AK):

State or Halfstate	**MACRO_ BREAKPOINT_DIA** (only trees with a DIA >= to this value are tallied within the macroplot outer ring)	**Minimum DIA**	**Maximum DIA**	**Plot size to calculate TPA**	**TPA_UNADJ**
	inches	inches	inches		
California	**24**	5	23.9	Subplot	6.018046
California	**24**	24	any	Macroplot	0.999188
Eastern Oregon	**24**	5	23.9	Subplot	6.018046
Eastern Oregon	**24**	24	any	Macroplot	0.999188
Western Oregon	**30**	5	29.9	Subplot	6.018046
Western Oregon	**30**	30	any	Macroplot	0.999188
Eastern Washington	**24**	5	23.9	Subplot	6.018046
Eastern Washington	**24**	24	any	Macroplot	0.999188
Western Washington	**30**	5	29.9	Subplot	6.018046
Western Washington	**30**	30	any	Macroplot	0.999188

Plot Area Expansion Factors

Area expansion factors (in acres) are used to scale plot-level data to population-level. These factors are found in the PLOT_PNW table in the PNW-FIADB along with a set of adjustment factors. There is a separate adjustment factor for each fixed plot size; the microplot, subplot, and macroplot. These adjustment factors are used to compensate for denied access, inaccessible, hazardous, and other reasons for not sampling a plot. This set of area expansion factors and adjustment factors on the PLOT_PNW table are used to calculate estimates of land area and a variety of tree attributes such as volume, biomass, or carbon. The addition of this table greatly simplifies the use of the PNW FIADB.



A PNW-only table that contains expansion factors and adjustment factors for the current stratification of each state in the PNW annual inventory. This table pulls data together from a number of POP tables, to allow users to link just one table instead of the many different POP tables. This is used along with other tables to summarize current annual inventory data with queries and reports. It is meant to simplify the database for ease of use by analysts and clients.

PLOT_PNW.PLT_CN = COND.PLT_CN links the unique plot record to condition class record.

PLOT_PNW.PLT_CN = PLOT.CN links the unique plot record together in both tables.

Note that in the national FIADB, area expansion factors are not in the PLOT table as they were in the past. Instead, one area expansion factor (EXPNS) for each stratum is stored in the POP_STRATUM table. These factors are applied to all plots found in a given stratum and may differ each time new data replaces older data. Some FIA work units preserve the stratification that is done each year, requiring a separate set of expansion factors and adjustment factors for each compilation. Each time the data are stratified differently, the adjustments and expansion factors will change. Currently, PNW-FIA does not include different stratifications in the FIADB. This simplifies the structure of the database for PNW data and results in just one evaluation for sampled land in each state.

FIA has chosen the term 'evaluation' to describe this process of storing different stratifications of data either for an individual set of data or for the changing sets of data through time. Each aggregation of data is given an evaluation id (EVALID). The user can select population estimates for the most current set of data stratified in a particular way, such as by state and owner; by national forest; or by county. In addition to being able to calculate population estimates, users can now calculate sampling error information because FIA is storing all of the phase 1 information used for the stratification. That information is stored for each estimation unit, which is usually a geographic subset of the State (see the POP_ESTN_UNIT table). For more information about evaluations and calculation of area expansion factors, see chapter 4.

Accuracy Standards

Forest inventory plans are designed to meet sampling error standards for area, volume, growth, and removals provided in the Forest Service directive (FSH 4809.11) known as the Forest Service Handbook (USDA 1989). These standards, along with other guidelines, are aimed at obtaining comprehensive and comparable information on timber resources for all parts of the country. FIA inventories are commonly designed to meet the specified sampling errors at the State level at the 67 percent confidence limit (one standard error). The Forest Survey Handbook mandates that the sampling error for area cannot exceed 3 percent error per 1 million acres of timberland. A five percent (Eastern U.S.) or 10 percent (Western U.S.) error per 1 billion cubic feet of growing stock on timberland is applied to volume, removals, and net annual growth. Unlike the mandated sampling error for area, sampling errors for volume, removals, and growth are only targets.

FIA inventories are extensive inventories that provide reliable estimates for large areas. As data are subdivided into smaller and smaller areas, such as a geographic unit or a county, the sampling errors increase and the reliability of the estimates goes down. For example:

- A State with 5 million acres of timberland would have a maximum allowable sampling error of 1.3 percent ($3\% \times (1{,}000{,}000)^{0.5} / (5{,}000{,}000)^{0.5}$)
- A geographic unit within that State with 1 million acres of timberland would have a 3.0 percent maximum allowable sampling error ($3\% \times (1{,}000{,}000)^{0.5} / (1{,}000{,}000)^{0.5}$)
- A county within that State with 100 thousand acres would have a 9.5 percent maximum allowable sampling error ($3\% \times (1{,}000{,}000)^{0.5} / (100{,}000)^{0.5}$) at the 67 percent confidence level.

The greater allowance for sampling error in smaller areas reflects the decrease in sample size as estimation area decreases. Estimation procedures and the calculation of confidence intervals for typical FIA tables are discussed in chapter 4. Additional information on estimation and confidence intervals can be found in Bechtold and Patterson (2005).

Chapter 3 -- Database Structure

This chapter provides information about the database tables, including detailed descriptions of all attributes within the tables. Each column or attribute in a table is listed with its unabbreviated name, followed by a description of the attribute. Attributes that are coded include a list of the codes and their meanings.

Table Descriptions and Relational Links

There are data tables and reference tables in the phase 1 and phase 2 portions of the FIA Database. The section that follows shows the proper linkages among tables. Note that the column name 'CN' is a unique number that identifies every record in the table. Please pay attention to the name of this CN when it appears in other tables. For example , the CN in the PLOT table is labeled as PLT_CN in other tables. These two CN's should be linked together in most cases. Note that most linkages are pre-set in the Access database, so when you include a table in a query it will automatically link with other tables if appropriate.

- PLOT table – Provides information relevant to the entire 1-acre field plot. This table links to most other tables, and the linkage is made using PLOT.CN = *TABLE_NAME*.PLT_CN (*TABLE_NAME* is the name of any table containing the column name PLT_CN). Below are some examples of linking PLOT to other tables.
  - PLOT.**CN** = PLOT_PNW.**PLT_CN** links the plot record together in both tables
  - PLOT.**CN** = COND.**PLT_CN** links the unique plot record to the condition class record
  - PLOT.**CN** = SUBPLOT.**PLT_CN** links the unique plot record to the subplot records.
  - PLOT.**CN** = TREE.**PLT_CN** links the unique plot record to the tree records.
  - PLOT.**CN** = SEEDLING.**PLT_CN** links the unique plot record to the seedling records.
  - PLOT.**CN** = POP_PLOT_STRATUM_ASSGN.**PLT_CN** links the stratum assigned to the plot record

- PLOT_PNW table – A PNW-only table that contains expansion factors and adjustment factors for the current stratification of the PNW annual inventory. This table pulls data together from a number of POP tables, to allow users to link just one table instead of the many different POP tables. This is used along with other tables to summarize current annual inventory data with queries and reports. It is meant to simplify the database, making it easier to use by analysts and clients.
  - PLOT_PNW.**PLT_CN**= PLOT.**CN** links the unique plot record together in both tables.
  - PLOT_PNW.**PLT_CN**= COND.**PLT_CN** links the unique plot record to the condition class record.

- COND table – Provides information on the discrete combination of landscape attributes that define the condition (a condition will have the same land class, reserved status, owner group, forest type, stand-size class, regeneration status, and stand density).
  - COND.**CN** = COND_PNW.**CND_CN** links the condition class record to the PNW condition table.
  - COND**.CN** = DWM_COND_DWM_CALC.**CND_CN** links the down woody material condition sum table to the condition table.
  - COND.**PLT_CN** = PLOT.**CN** links the condition class record to the plot table.
  - COND.**PLT_CN** = PLOT_PNW.**PLT_CN** links the condition class record to the plot record
  - COND.**PLT_CN**=TREE.**PLT_CN** and COND.**CONDID**=TREE.**CONDID** links the condition class record to the tree data.
  - COND.**PLT_CN** = SITETREE.**PLT_CN** and COND.**CONDID** = SITETREE.**CONDID** links the condition class record to the site tree data.

- COND_PNW table – Provides regional variables, condition level sums, and grouping variables for each condition on the plot.
  - COND_PNW.**CND_CN =** COND.**CN** = links the condition class record to the PNW condition table.

- SUBPLOT table – Describes the features of a single subplot. There are multiple subplots per 1-acre field plot and there can be multiple conditions sampled on each subplot.
  - SUBPLOT.**PLT_CN =**PLOT.**CN** links the unique plot record to the subplot records.
  - SUBPLOT.**PLT_CN** = COND.**PLT_CN** and SUBPLOT.**MACRCOND** = COND.**CONDID** links the macroplot conditions to the Cover of plant canopy as a percentage of the area of the 24' radius subplot condition class record.
  - SUBPLOT.**PLT_CN** = COND.**PLT_CN** and SUBPLOT.**SUBPCOND** = COND.**CONDID** links the subplot conditions to the condition class record.
  - SUBPLOT.**PLT_CN** = COND.**PLT_CN** and SUBPLOT.**MICRCOND** = COND.**CONDID** links the microplot conditions to the condition class record.

- SUBPLOT_PNW table – Provides regional variables collected on the subplot.
  - SUBPLOT_PNW.**SBP_CN** =SUBPLOT.**CN** = links the subplot record to the regional PNW subplot table.

- SUBP_COND table – Contains information about the proportion of a subplot in a condition.
  - SUBP_COND.**PLT_CN =** PLOT.**CN** links the subplot condition class record to the plot table.
  - SUBP_COND.**PLT_CN** = COND.**PLT_CN** and SUBP_COND.**CONDID** = COND.**CONDID** links the condition class records found on the four subplots to the subplot description.

- SUBP_COND_ROOT_DIS_PNW table – Contains information about regional variables that describe the type and amount of root disease recorded on a subplot.
  - Link STATECD, COUNTYCD, PLOT, SUBP, and CONDID to the same columns in the SUBP_COND table
  - SUBP_COND_ROOT_DIS_PNW.**PLT_CN** = COND.**PLT_CN** and
  - SUBP_COND_ROOT_DIS_PNW.**CONDID** = COND.**CONDID** links the condition class records found on the four subplots to the condition class information on the COND table.

- TREE table – Provides information for each tree 1 inch in diameter and larger found on a microplot, subplot, or core-optional microplot.
  - TREE.**CN =** TREE_PNW.**TRE_CN** = links the tree records to the PNW tree records.
  - TREE.**CN** = TREE_REGIONAL_BIOMASS.**TRE_CN** links a tree regional biomass record to the tree record.
  - TREE.**PLT_CN =** PLOT.**CN** links the tree records to the unique plot record.
  - TREE.**PLT_CN =** COND.**PLT_CN** and TREE.**CONDID** = COND.**CONDID** links the tree records to the unique condition record.
  - PLOT_PNW.**PLT_CN** = COND.**PLT_CN** and COND.**PLT_CN** = TREE.**PLT_CN** and COND.**CONDID** = TREE.**CONDID** links the tree records to the unique condition and plot record. This is a common set of linkages for most tree level summaries.

- TREE_PNW table – Provides regional variables and other compiled variables (i.e. TPA_ADJ, Scribner volume, and total stem volume)
  - TREE_PNW.**TRE_CN** =TREE.**CN** links the tree records to the PNW tree records.
  - TREE_PNW.**TRE_CN** = TREE_REGIONAL_BIOMASS.**TRE_CN** links a tree regional biomass record to the PNW tree record.

- TREE_REGIONAL_BIOMASS table – Contains total AG and merchantable stem biomass estimates computed using PNW equations and methodology. This biomass is considered a better estimate for regional analyses, than the ratio approach in the component ratio method (CRM) found on the TREE table. This table retains valuable information for generating biomass estimates that match earlier published reports.
  - TREE_REGIONAL_BIOMASS.**TRE_CN** =TREE.**CN** links a tree regional biomass record to the tree record.

- SEEDLING table – Provides a count of the number of live trees of a species found on a microplot that are less than 1 inch in diameter but at least 6 inches in length for conifer species or at least 12 inches in length for hardwood species.
  - SEEDLING.**PLT_CN =** COND**.PLT_CN and** SEEDLING.**CONDID =** COND**.CONDID** links the seedling records to the unique condition record.

- SITETREE table – Provides information on the site tree(s) collected in order to calculate site index and/or site productivity information for a condition.
  - PLOT**.CN** = SITETREE.**PLT_CN** links the site tree records to the unique plot record.
  - SITETREE.**PLT_CN** = COND.**PLT_CN** and SITETREE.**CONDID** = COND.**CONDID** links the site tree record(s) to the unique condition class record.

- SURVEY table – Contains one record for each year an inventory is conducted in a State .
  - SURVEY.**CN** = PLOT.**SRV_CN** links the unique inventory record for a State and year to plot records.

- COUNTY table – Reference table for the county and survey unit codes and names.
  - COUNTY.**CN** = PLOT.**CTY_CN** links the unique county record to the plot record.

- DWM_COND_DWM_CALC table – Provides information on all down woody material summarized for each forest condition class on the plot. Includes summaries of CWD, FWD, Piles, duff and litter. In general, most users will find it easiest to use this table for summary queries and reports.
  - DWM_COND_DWM_CALC.**CND_CN** = COND**.CN** links the down woody material condition sums to the condition record.

- DWM_TRANSECT_SEGMENT table – Provides information on coarse woody debris transect segments.
  - Links to the DWM_COARSE_WOODY_DEBRIS table via PLT_CN, SUBP, TRANSECT, CONDID

- DWM_COARSE_WOODY_DEBRIS table – Provides information on coarse woody debris (CWD) >= 3” in diameter. Includes log dimensions and compiled estimates of volume, biomass, carbon, logs/acre.
  - DWM_COARSE_WOODY_DEBRIS.**PLT_CN** = COND**.PLT_CN** and DWM_COARSE_WOODY_DEBRIS.**CONDID** = COND**.CONDID** links the CWD table to the condition record to produce customized summaries based on CWD attributes such as log diameter, log length, decay class or species.

- DWM_FINE_WOODY_DEBRIS table – Provides information on fine woody debris in three size classes. Includes counts by size class and compiled estimates of volume, biomass, and carbon.
  - DWM_FINE_WOODY_DEBRIS. **PLT_CN** = COND**.PLT_CN** and DWM_FINE_WOODY_DEBRIS.**CONDID** = COND**.CONDID** links the FWD table to the condition record. This linkage is rarely done because FWD must be used at the condition level, therefore it is suggested to use estimates provided in the DWM_COND_DWM_CALC table.

- DWM_RESIDUAL_PILE table – Provides information on large residue piles encountered on the plot. Includes data on pile shape and size, and compiled estimates of volume, biomass, and carbon.
  - DWM_RESIDUAL_PILE.**PLT_CN** =COND.**PLT_CN** and DWM_RESIDUAL_PILE.**CONDID** = COND.**CONDID** links the pile record to the condition records.

- DWM_DUFF_LITTER_FUEL table – Provides information on duff, litter and fuelbed measurements collected on each subplot transect. Includes measured data only.
  - DWM_DUFF_LITTER_FUEL.**PLT_CN** =COND.**PLT_CN** and DWM_DUFF_LITTER_FUEL.**CONDID** = COND.**CONDID** links the fuels record to the condition records.

- DWM_MICROPLOT_FUEL table – Provides information on shrub, herb and litter measurements collected on each microplot. Includes measured data only.
  - DWM_ MICROPLOT_FUEL.**PLT_CN** =SUBPLOT.**PLT_CN** and DWM_MICROPLOT_FUEL.**SUBP** = SUBPLOT.**SUBP** links the fuels record to the subplot and plot records.

- P2VEG_SUBPLOT_SPP table – Provides percent cover data of vegetation species identified on the subplot.
  - PLOT.CN = P2VEG_SUBPLOT_SPP.PLT_CN links the vegetation subplot species record(s) to the unique plot record.
  - SUBP_COND.PLT_CN = P2VEG_SUBPLOT_SPP.PLT_CN and SUBP_COND.CONDID = P2VEG_SUBPLOT_SPP.CONDID and SUBP_COND.SUBP = P2VEG_SUBPLOT_SPP.SUBP links the vegetation subplot species record(s) to the unique subplot condition record.
  - P2VEG_SUBPLOT_SPP.VEG_SPCD = REF_PLANT_DICTIONARY.SYMBOL links the P2 vegetation subplot NRCS species code to the plant dictionary reference species code.

- P2VEG_SUBP_STRUCTURE – Provides percent cover by layer by growth habit
  - PLOT.CN = P2VEG_SUBP_STRUCTURE. PLT_CN links the subplot structure record(s) to the unique plot record
  - SUBP_COND.PLT_CN = P2VEG_SUBP_STRUCTURE.PLT_CN and SUBP_COND.CONDID = P2VEG_SUBP_STRUCTURE.CONDID and SUBP_COND.SUBP = P2VEG_SUBP_STRUCTURE.SUBP links the vegetation subplot structure record(s) to the unique subplot condition record.

- VEG_SP_PNWRS table – Understory vegetation profile table. Provides information on the abundance, structure, and species composition of understory plant communities.
  - VEG_SP_PNWRS.**SBP_CN**= SUBPLOT.**CN** links vegetation profile record to the subplot record.

- VEG_SP_CONDSUM table – Condition summary of understory vegetation by species. Provides information on the growth habit and average percent cover of understory plant species on the condition.
  - VEG_SP_CONDSUM.**PLT_CN**= COND.**PLT_CN** and VEG_SP_CONDSUM.**CONDID**= COND.**CONDID** links links vegetation profile record to the condition record.

- VEG_LIFEFORM_CONDSUM table – Condition summary of understory vegetation by lifeform. Provides information on the average percent cover of understory plant species on the condition.
  - VEG_LIFEFORM_CONDSUM.**PLT_CN**= COND.**PLT_CN** and VEG_LIFEFORM_CONDSUM.**CONDID**= COND.**CONDID** links links vegetation profile record to the condition record.

- POP_ESTN_UNIT table – An estimation unit is a geographic area that can be drawn on a map. It has known area and the sampling intensity must be the same within a stratum within an estimation unit. Generally estimation units are contiguous areas, but exceptions are made when certain ownerships, usually national forests, are sampled at different intensities. One record in the POP_ESTN_UNIT table corresponds to a single estimation unit.
  - POP_ESTN_UNIT**.CN** = POP_STRATUM.**ESTN_UNIT_CN** links the unique stratified geographical area (ESTN_UNIT) to the strata (STRATUMCD) that are assigned to each ESTN_UNIT.

- POP_EVAL table – An evaluation is the combination of a set of plots (the sample) and a set of phase 1 data (obtained through remote sensing, called stratification) that can be used to produce population estimates for a State. A record in the POP_EVAL table identifies one evaluation and provides some descriptive information about how the evaluation may be used. In the PNW FIADB there are two evaluations per state (all years): one for sampled plots, and one for all plots (sampled and unsampled)

STATE		EVALID	EVALUATION DESCRIPTION (the grey EVALID's below are used in most cases)
OR	41	**4**	Oregon: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
CA	6	**5**	California: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
WA	53	**6**	Washington: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
AK	2	**102**	Alaska: Most recent 10 years, **Sampled** plots
OR	41	**2**	Oregon: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
CA	6	**1**	California: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
WA	53	**3**	Washington: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots

- POP_EVAL**.CN =** POP_ESTN_UNIT.**EVAL_CN** links the unique evaluation identifier (EVALID) in the POP_EVAL table to the unique geographical areas (ESTN_UNIT) that are stratified. Within a population evaluation (EVALID) there can be multiple population estimation units, or geographic areas across which there are a number of values being estimated (e.g., estimation of volume across counties for a given State.)
- POP_EVAL_ATTRIBUTE table – Provides information as to which population estimates can be provided by an evaluation. If an evaluation can produce 22 of the 79 currently supported population estimates, there will be 22 records in the POP_EVAL_ATTRIBUTE table (one per population estimate) for that evaluation.
  - POP_EVAL**.CN** = POP_EVAL_ATTRIBUTE.**EVAL_CN** links the unique evaluation identifier to the list of population estimates that can be derived for that evaluation.

- POP_EVAL_GRP table – – Lists and describes the evaluation groups. One record in the POP_EVAL_GRP table can be linked to all the evaluations that were used in generating estimates for a State inventory report.
  - POP_EVAL_GRP**.CN =** POP_EVAL_TYP.**EVAL_GRP_CN** = links the evaluation group record to the evaluation type record.
  - POP_EVAL_GRP**.CN =** POP_EVAL**.EVAL_GRP_CN** = links the evaluation record to the evaluation group record.

- POP_EVAL_TYP table – Provides information on the type of evaluations that were used to generate a set of tables for an inventory report.
  - POP_EVAL_TYP.**EVAL_CN** = POP_EVAL**.CN** links the evaluation type record to the evaluation record.
  - POP_EVAL_TYP.**EVAL_GRP_CN** = POP_EVAL_GRP**.CN** links the evaluation type record to the evaluation group record.
  - POP_EVAL_TYP.**EVAL_TYP** = REF_POP_EVAL_TYP_DESCR.**EVAL_TYP** links an evaluation type record to an evaluation type description reference record.

- POP_PLOT_STRATUM_ASSGN table – Stratum information is assigned to a plot by overlaying the plot's location on the phase 1 imagery. Plots are linked to their appropriate stratum for an evaluation via the POP_PLOT_STRATUM_ASSGN table.
  - POP_PLOT_STRATUM_ASSGN.**PLT_CN** = PLOT**.CN** links the stratum assigned to the plot record.
  - POP_PLOT_STRATUM_ASSGN.**STRATUM_CN** = POP_STRATUM**.CN**

- POP_STRATUM table – The area within an estimation unit is divided into strata. The area for each stratum can be calculated by determining the proportion of phase 1 pixels/plots in each stratum and multiplying that proportion by the total area in the estimation unit. Information for a single stratum is stored in a single record of the POP_STRATUM table.
  - POP_STRATUM.**CN** = POP_PLOT_STRATUM_ASSGN.**STRATUM_CN**

- REF_CITATION table – Identifies the published source for information on specific gravities, moisture content, and bark as a percent of wood volume that is provided in the REF_SPECIES table.
  - REF_SPECIES.**WOOD_SPGR_GREENVOL_DRYWT**_CIT = REF_CITATION.**CITATION_NBR**
  - REF_SPECIES.**BARK_SPGR_GREENVOL_DRYWT_CIT** = REF_CITATION.**CITATION_NBR**
  - REF_SPECIES.**MC_PCT_GREEN_WOOD_CIT** = REF_CITATION.**CITATION_NBR**
  - REF_SPECIES.**MC_PCT_GREEN_BARK_CIT** = REF_CITATION.**CITATION_NBR**
  - REF_SPECIES.**WOOD_SPGR_MC12VOL_DRYWT_CIT** = REF_CITATION.**CITATION_NBR**
  - REF_SPECIES.**BARK_VOL_PCT_CIT** = REF_CITATION.**CITATION_NBR**

- REF_FOREST_TYPE table – A reference table containing forest type codes, descriptive names, forest type group codes and other information. Data users should link codes as shown below and then obtain the information stored in MEANING to convert the code to a name.
  - REF_FOREST_TYPE.**VALUE** = COND.**FORTYPCD** links the forest type reference record to the condition forest code used for reporting and analysis purposes.
  - REF_FOREST_TYPE.**VALUE** = COND.**FLDTYPCD** links the forest type reference record to the condition forest type code recorded by field crews.
  - REF_FOREST_TYPE.**VALUE** = COND.**FORTYPCDCALC** links the forest type reference record to the condition forest type code calculated by an algorithm.

- REF_FOREST_TYPE_GROUP table – A reference table containing forest type group codes, descriptive names, and other information. Data users should link codes as shown below and then obtain the information stored in MEANING to convert the group code to a name.
  - REF_FOREST_TYPE_GROUP.**TYPGRPCD =** REF_FOREST_TYPE.**TYPGRPCD** and REF_FOREST_TYPE.**VALUE** = COND.**FORTYPCD** links the forest type group reference record to the forest type reference record for reporting and analysis purposes.

- REF_HABTYP_DESCRIPTION – A reference table containing habitat type codes, and associated scientific plant species abbreviation and common name of each habitat type. Users wanting to know the publication that further describes the habitat type should link codes as shown below to obtain the corresponding publication information.
  - COND.HABTYPCD1 = REF_HABTYP_DESCRIPTION.HABTYPCD and COND.HABTYPCD1_DESCR_PUB_CD = REF_HABTYP_DESCRIPTION.PUB_CD and REF_HABTYP_DESCRIPTION.PUB_CD = REF_HABTYP_PUBLICATION.PUB_CD links the primary habitat type code to reference description habitat code and primary habitat type publication code to the reference description publication code and reference description publication code to the publication reference information. (see figure 5.5)
  - COND.HABTYPCD2 = REF_HABTYP_DESCRIPTION.HABTYPCD and COND.HABTYPCD2_DESCR_PUB_CD = REF_HABTYP_DESCRIPTION.PUB_CD and REF_HABTYP_DESCRIPTION.PUB_CD = REF_HABTYP_PUBLICATION.PUB_CD links the secondary habitat type code to reference description habitat code and secondary habitat type publication code to the reference description publication code and reference description publication code to the publication reference information.

- REF_HABTYP_PUBLICATION - A reference table containing the publication information (title, author) for the publication code. See the links described above in REF_HABTYP_DESCRIPTION.

- REF_POP_ATTRIBUTE table – Identifies all of the population estimates that are currently supported, and provides information useful to the estimation procedure. There are currently many records in the REF_POP_ATTRIBUTE table providing information ranging from how to calculate forest area to volume and biomass on forestland.
  - REF_POP_ATTRIBUTE.**ATTRIBUTE_NBR** = POP_EVAL_ATTRIBUTE.**ATTRIBUTE_NBR** links the description of the population estimate to the evaluations used to make those estimates.

- REF_POP_EVAL_TYP_DESCR table – A reference table containing the description for evaluation types.
  - REF_POP_EVAL_TYP_DESCR.**EVAL_TYP** = POP_EVAL_TYP.**EVAL_TYP** links an evaluation type description reference record to an evaluation type record.

- REF_SPECIES table – A reference table containing the species code, descriptive common name, scientific name, and many other attributes for each species. For example, data users who want to convert the species code to the associated common name should link codes as shown below and then obtain the information stored in COMMON_NAME.
  - REF_SPECIES.**SPCD** = TREE.**SPCD** links the species reference table record to the tree species code.
  - REF_SPECIES.**SPCD** = SEEDLING.**SPCD** links the species reference table record to the seedling species code.
  - REF_SPECIES.**SPCD** = SITETREE.**SPCD** links the species reference table record to the site tree species code.

- REF_SPECIES_GROUP table – A reference table containing the species group code, descriptive name and several other attributes for each species group. Data users should link codes as shown below and then obtain the information stored in NAME to convert the code to a descriptive name.
  - REF_SPECIES_GROUP.**SPGRPCD** = TREE.**SPGRPCD** links the species group reference table to the tree species group code.
  - REF_SPECIES_GROUP.**SPGRPCD** = SEEDLING.**SPGRPCD** links the species reference table record to the seedling species group code.
  - REF_SPECIES_GROUP.**SPGRPCD** = SITETREE.**SPGRPCD** links the species reference table record to the site tree species group code.
  -
- REF_PLANT_DICTIONARY table – A reference table containing information about plant species as defined in the NRCS PLANTS database. The species symbol, common name, scientific name, growth habit and other identifying information are included in this table. Data users should link codes as shown below and then obtain the information stored in one of the columns such as COMMON_NAME or SCIENTIFIC_NAME to convert the code to a name.
  - REF_PLANT_DICTIONARY.SYMBOL = P2VEG_SUBPLOT_SPP.VEG_SPCD links the plant dictionary reference species code to the P2 vegetation subplot NRCS species code.

- REF_STATE_ELEV – Reference table containing information about minimum and maximum elevation found within a State.
  - REF_STATE_ELEV.**STATECD** = PLOT.**STATECD** links the State elevation record to the plot record.

- REF_UNIT table – The description for each survey unit in a State.
  - REF_UNIT.**STATECD** = PLOT.**STATECD** and REF_UNIT.**VALUE** = PLOT.**UNITCD** links the survey unit description (MEANING) to the PLOT record.

- BOUNDARY table – Provides a description of the demarcation line between two conditions that occur on a single subplot.
  - BOUNDARY.**PLT_CN =** PLOT**.CN** links the boundary records to the unique plot record.

Figure 4, helps to illustrate how the phase 1 and other population estimation tables relate to one another and to the PLOT table. When using all of the 'POP' tables to produce estimates and standard errors for current land area, tree attributes, or down wood attributes, the linkages among tables can be complex. In the PNW-FIADB, a new (non-national) table was created called PLOT_PNW, which pulls data from the POP tables into one table for users to quickly summarize or analyze data for the current annual inventory stratification.

Figure 4. National FIADB linkages -- Relationships among phase 1 and population estimation tables to the phase 2 plot and other frequently used tables.

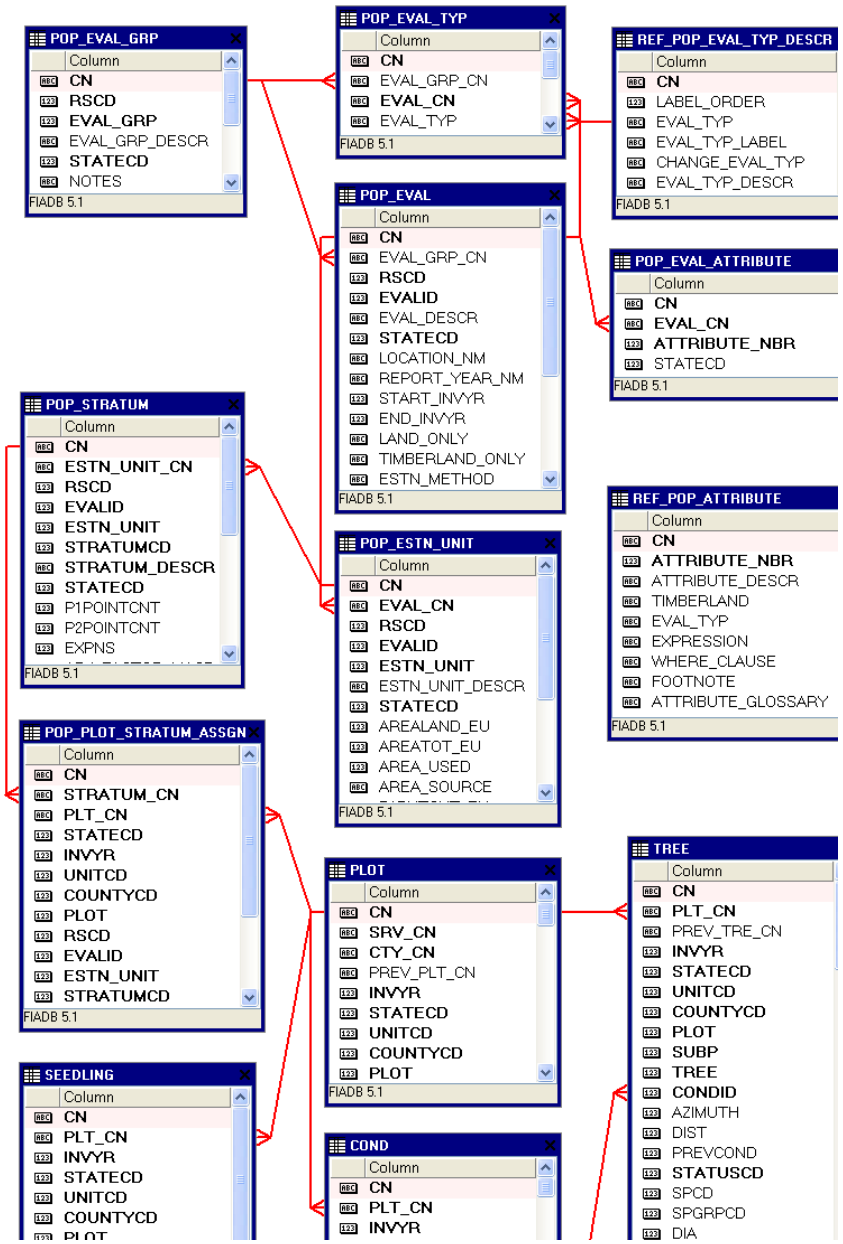
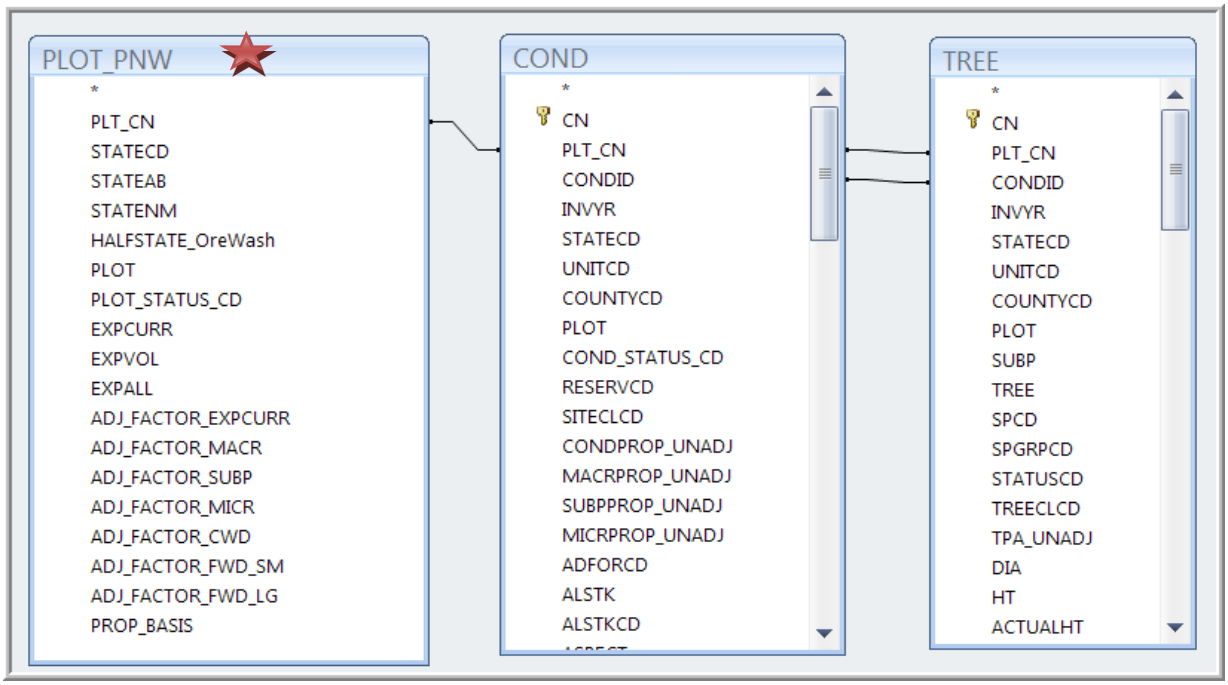


Figure 4_a. PNW FIADB linkages -- Relationships among tables in the PNW database



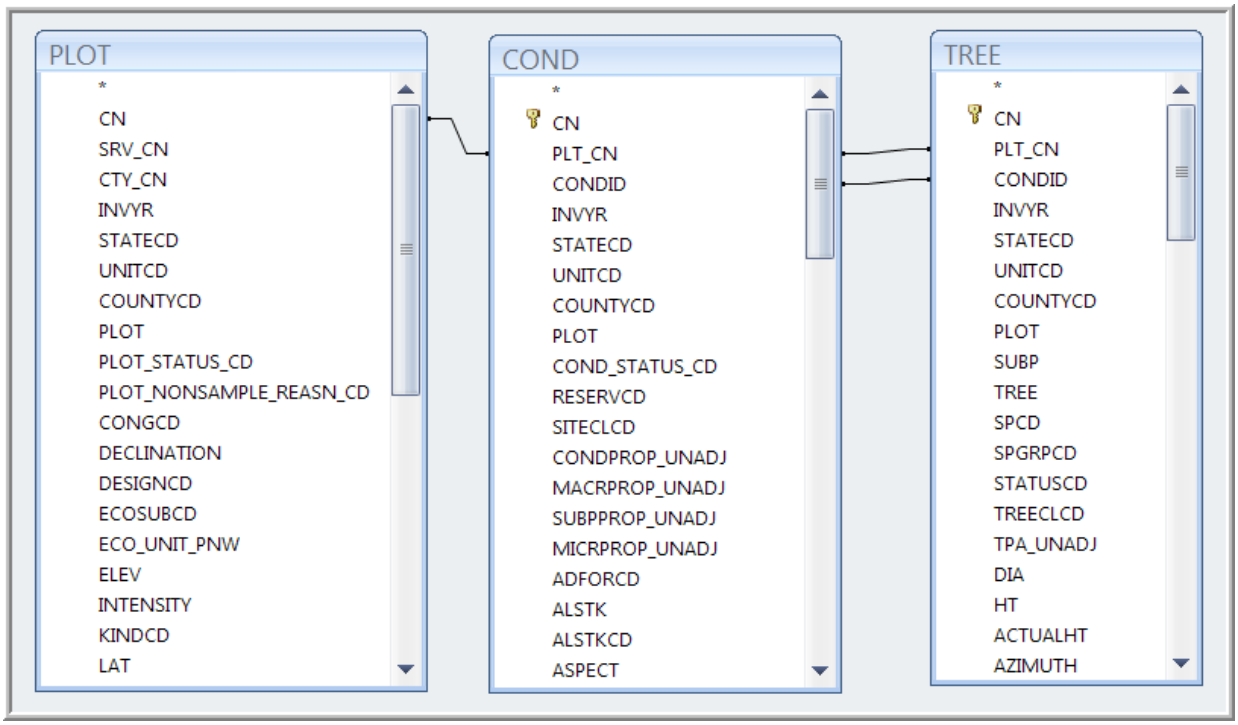


Figure 4_a. (cont.) PNW FIADB linkages -- Relationships among tables in the PNW database

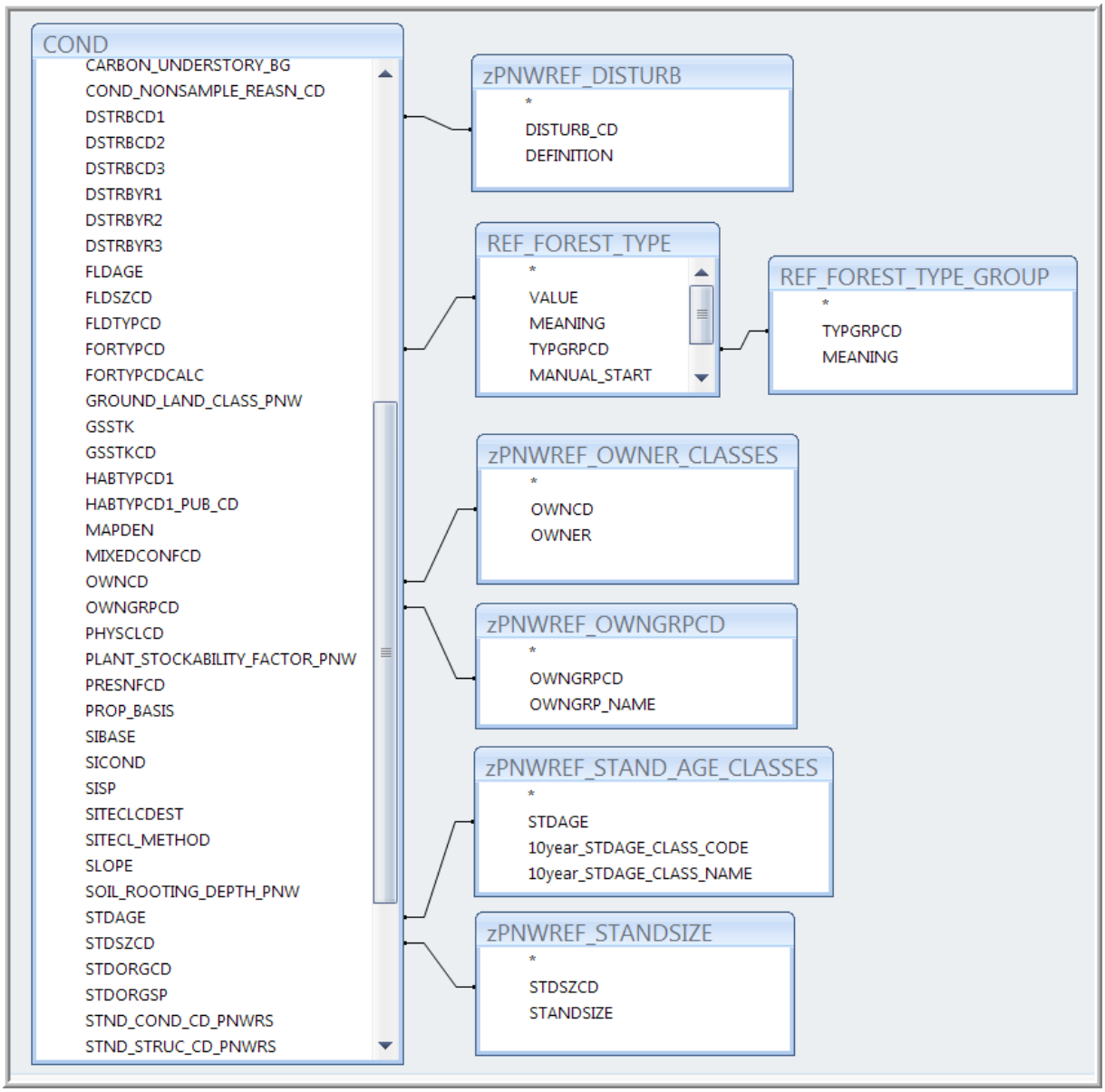


Figure 4_a. (cont.) PNW FIADB linkages -- Relationships among tables in the PNW database

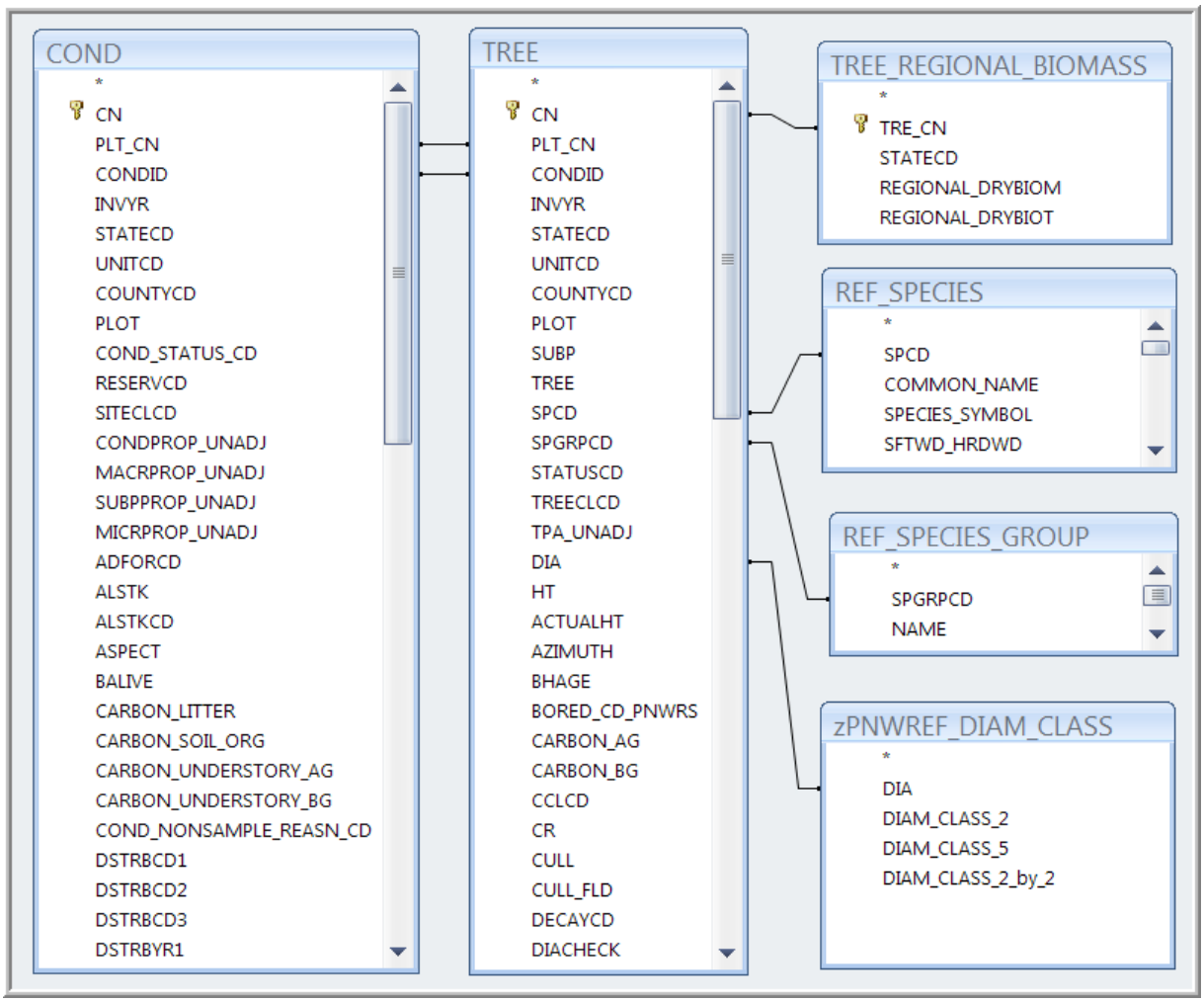
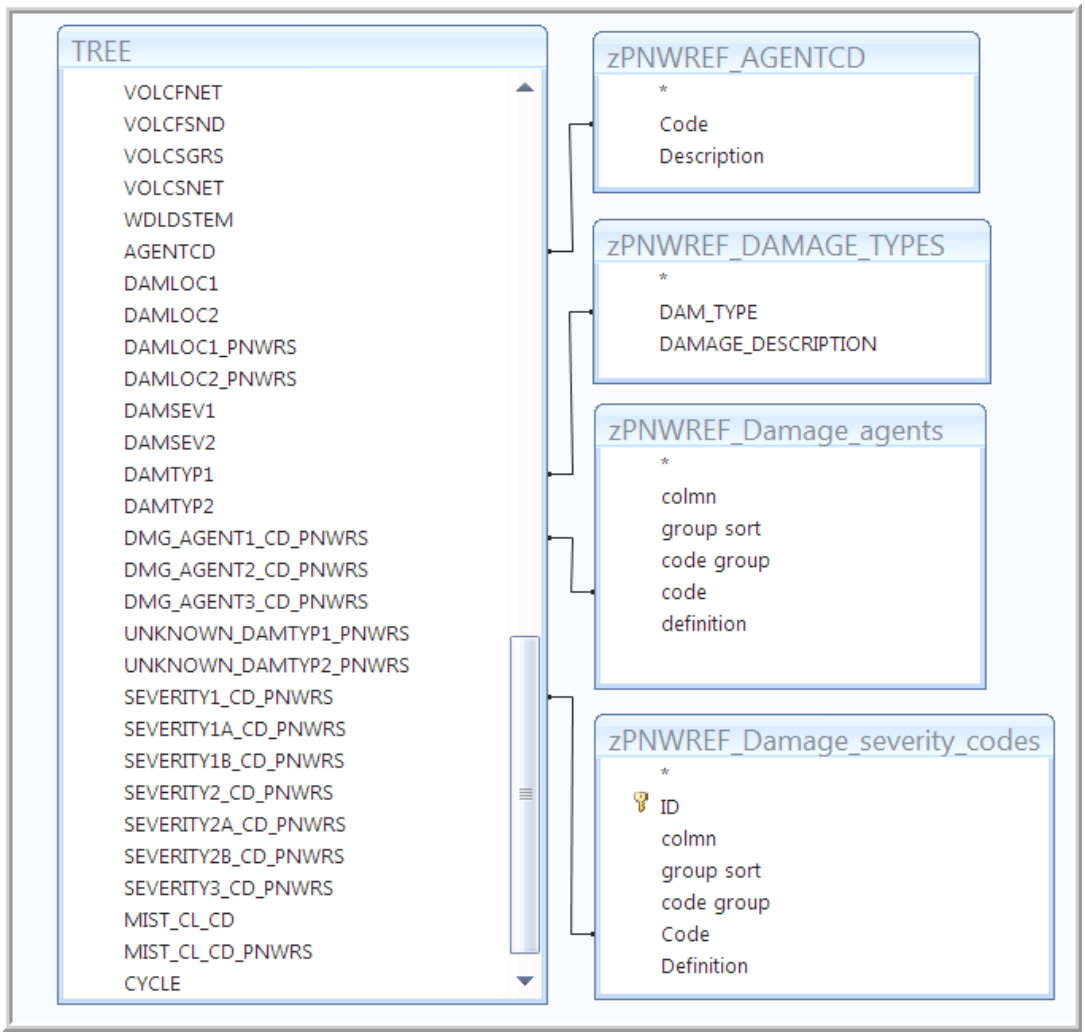
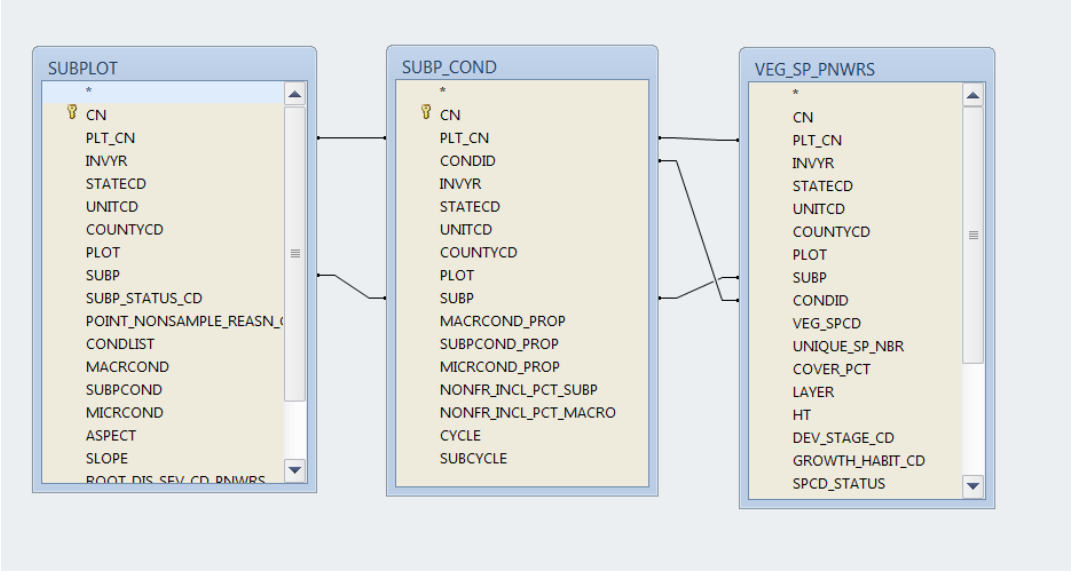
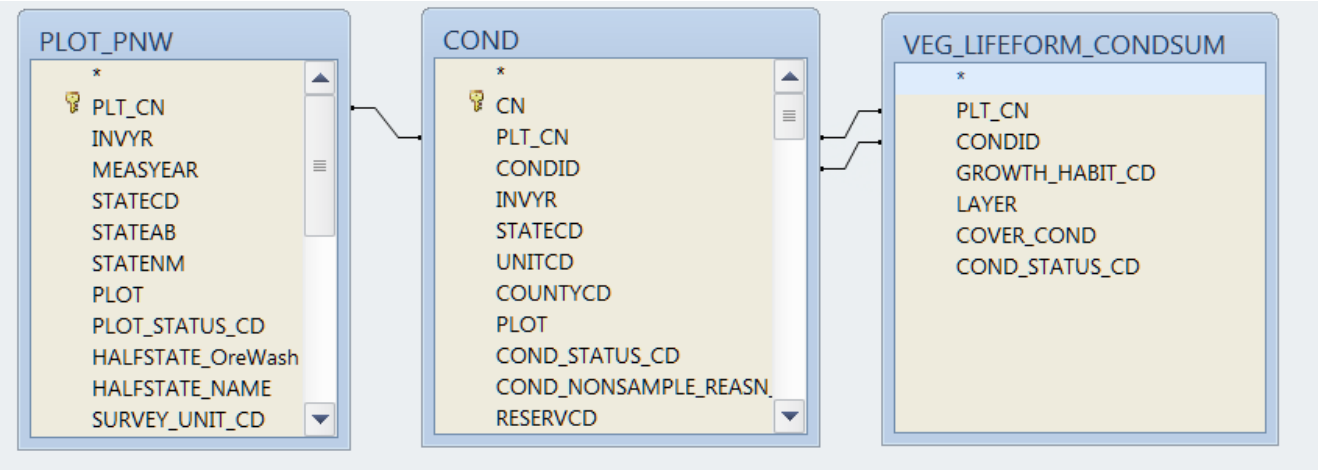
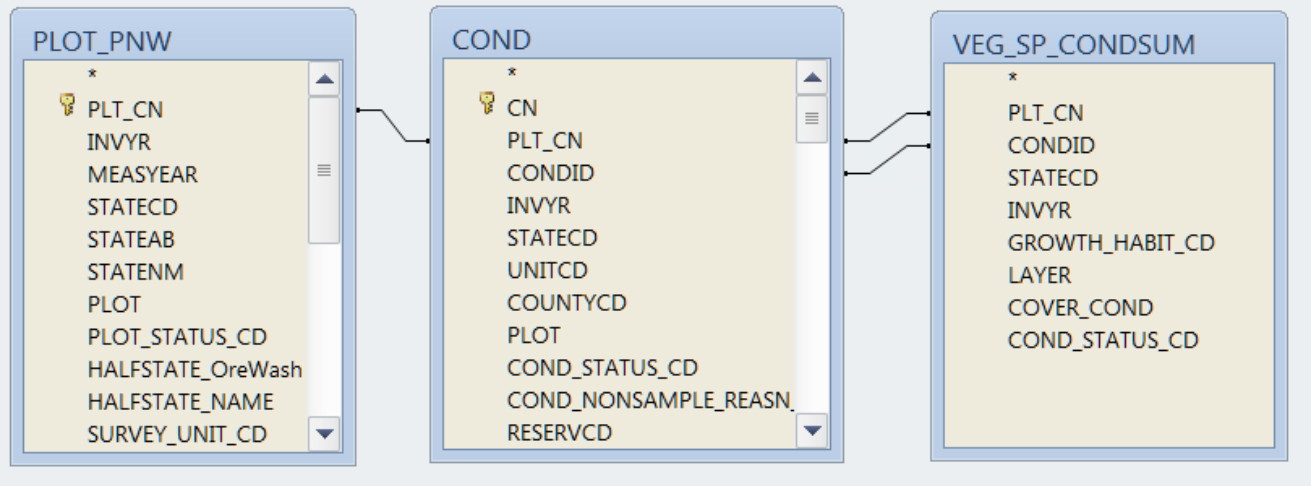


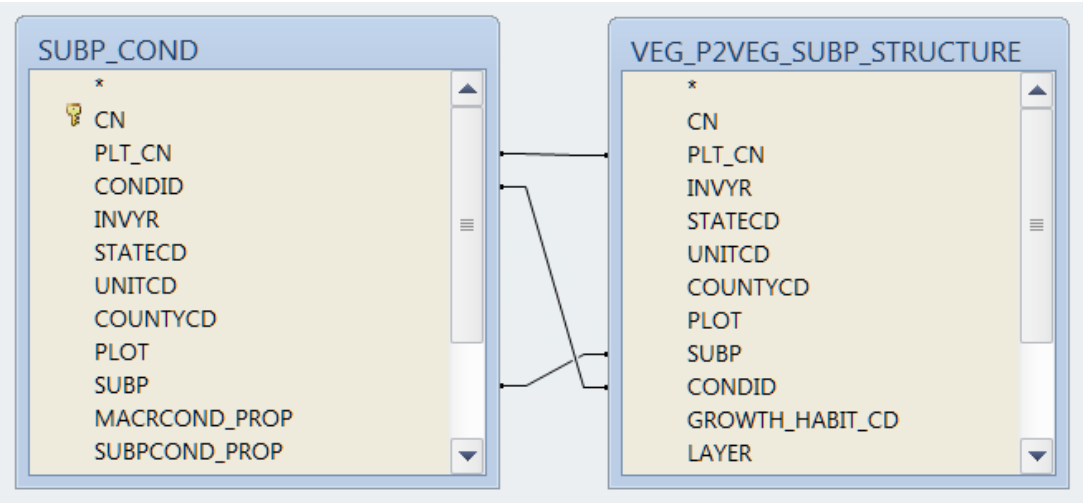
Figure 4_a. (cont.) PNW FIADB linkages -- Relationships among tables in the PNW database

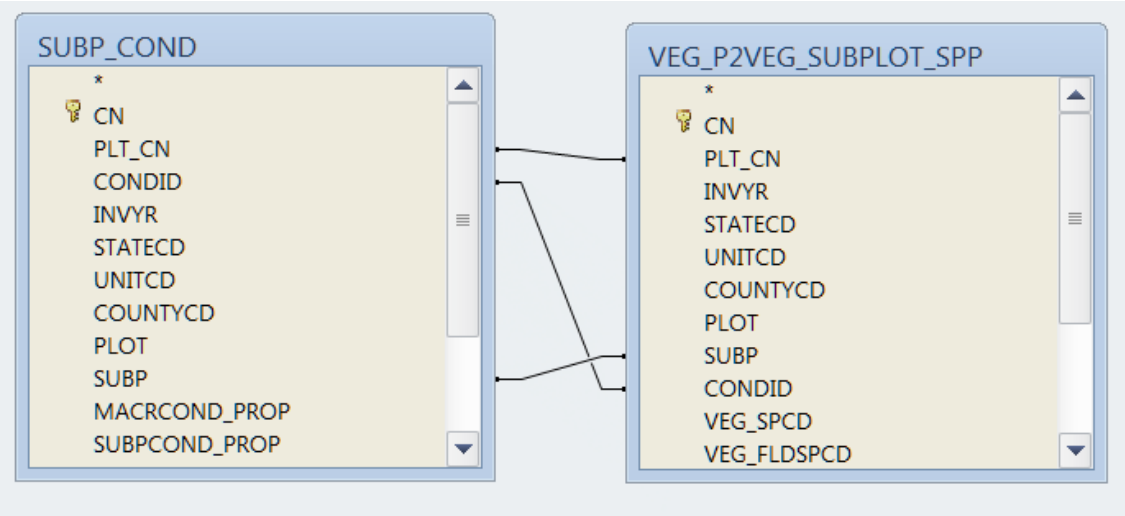


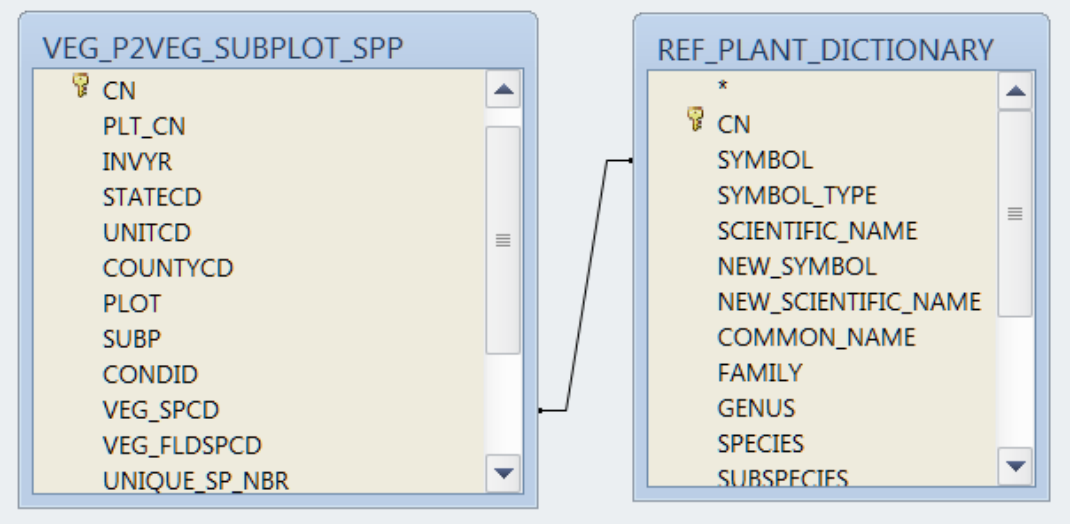



PLOT_PNW
*
PLT_CN
INVYR
MEASYEAR
STATECD
STATEAB
STATENM
PLOT
PLOT_STATUS_CD
HALFSTATE_OreWash
HALFSTATE_NAME
SURVEY_UNIT_CD
COND
*
CN
PLT_CN
CONDID
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
COND_STATUS_CD
COND_NONSAMPLE_REASN
RESERVCD
VEG_LIFEFORM_CONDSUM
*
PLT_CN
CONDID
GROWTH_HABIT_CD
LAYER
COVER_COND
COND_STATUS_CD


PLOT_PNW
*
PLT_CN
INVYR
MEASYEAR
STATECD
STATEAB
STATENM
PLOT
PLOT_STATUS_CD
HALFSTATE_OreWash
HALFSTATE_NAME
SURVEY_UNIT_CD
COND
*
CN
PLT_CN
CONDID
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
COND_STATUS_CD
COND_NONSAMPLE_REASN
RESERVCD
VEG_SP_CONDSUM
*
PLT_CN
CONDID
STATECD
INVYR
GROWTH_HABIT_CD
LAYER
COVER_COND
COND_STATUS_CD


SUBP_COND
*
CN
PLT_CN
CONDID
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
SUBP
MACRCOND_PROP
SUBPCOND_PROP
VEG_P2VEG_SUBP_STRUCTURE
*
CN
PLT_CN
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
SUBP
CONDID
GROWTH_HABIT_CD
LAYER


SUBP_COND
*
CN
PLT_CN
CONDID
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
SUBP
MACRCOND_PROP
SUBPCOND_PROP
VEG_P2VEG_SUBPLOT_SPP
*
CN
PLT_CN
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
SUBP
CONDID
VEG_SPCD
VEG_FLDSPCD


VEG_P2VEG_SUBPLOT_SPP
CN
PLT_CN
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
SUBP
CONDID
VEG_SPCD
VEG_FLDSPCD
UNIQUE_SP_NBR
REF_PLANT_DICTIONARY
*
CN
SYMBOL
SYMBOL_TYPE
SCIENTIFIC_NAME
NEW_SYMBOL
NEW_SCIENTIFIC_NAME
COMMON_NAME
FAMILY
GENUS
SPECIES
SUBSPECIES

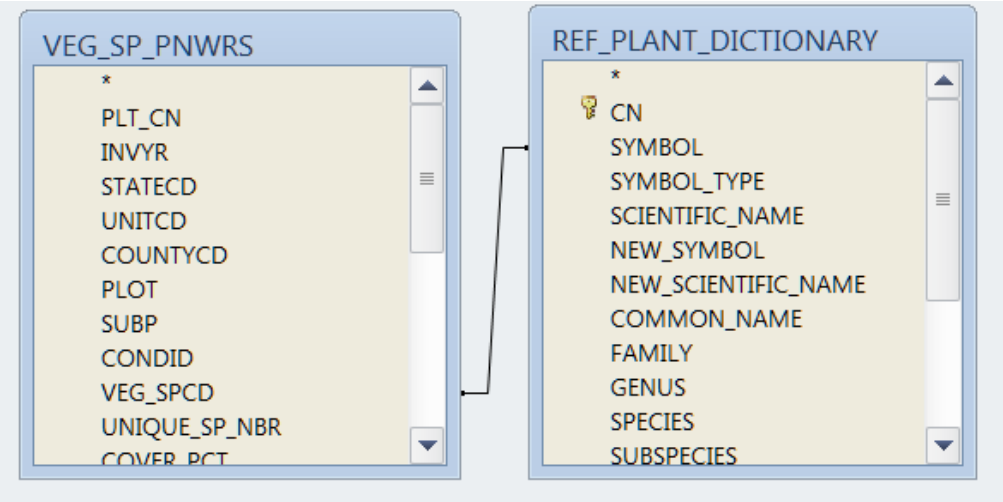
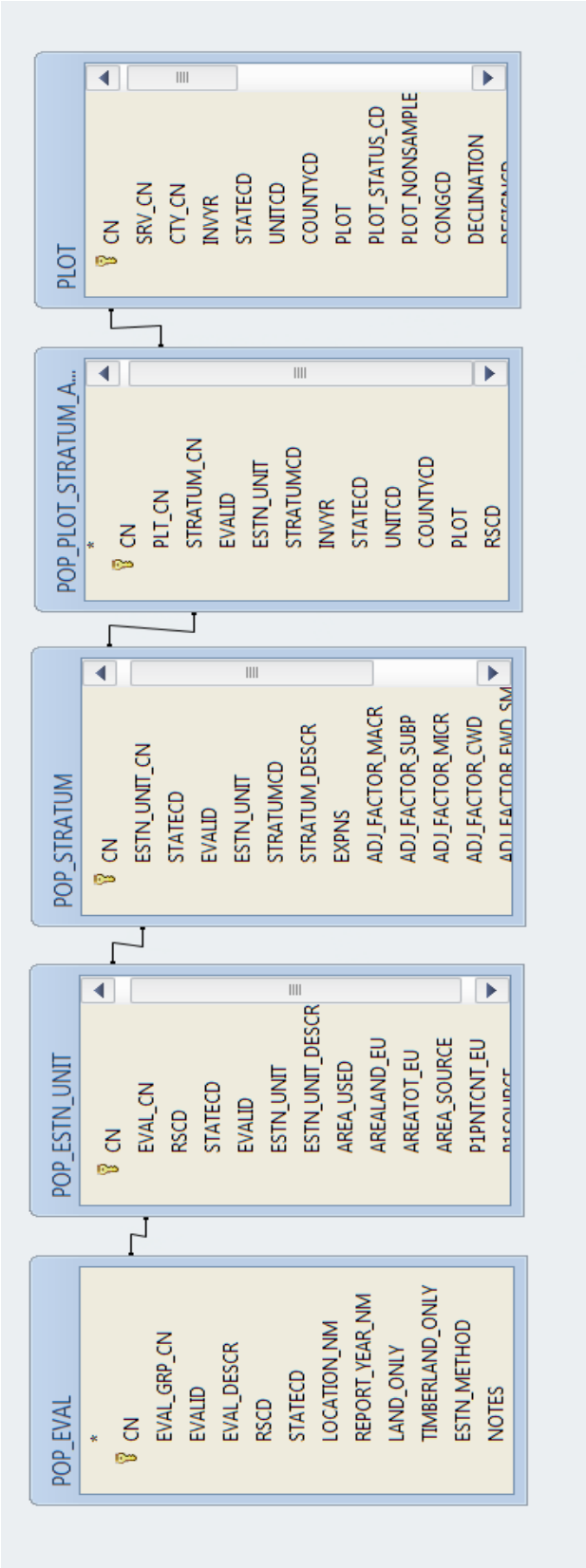
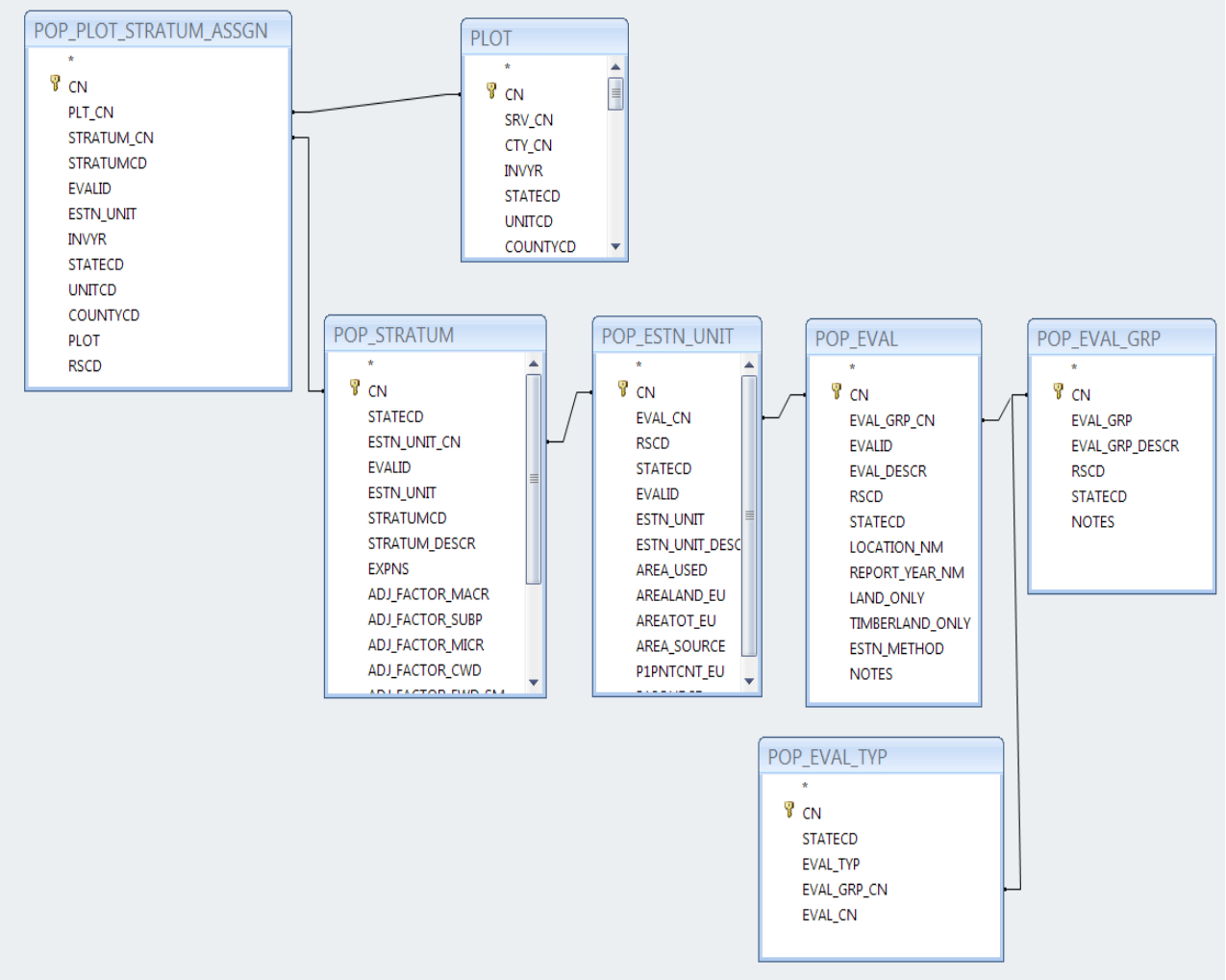

VEG_SP_PNWRS
*
PLT_CN
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
SUBP
CONDID
VEG_SPCD
UNIQUE_SP_NBR
REF_PLANT_DICTIONARY
*
CN
SYMBOL
SYMBOL_TYPE
SCIENTIFIC_NAME
NEW_SYMBOL
NEW_SCIENTIFIC_NAME
COMMON_NAME
FAMILY
GENUS
SPECIES
SUBSPECIES

Figure 4_b. PNW FIADB linkages -- Relationships among tables in the PNW database

Using the set of 'POP' (Population) tables to develop population estimates.




POP_PLOT_STRATUM_ASSGN
*
CN
PLT_CN
STRATUM_CN
STRATUMCD
EVALID
ESTN_UNIT
INVYR
STATECD
UNITCD
COUNTYCD
PLOT
RSCD
PLOT
*
CN
SRV_CN
CTY_CN
INVYR
STATECD
UNITCD
COUNTYCD
POP_STRATUM
*
CN
STATECD
ESTN_UNIT_CN
EVALID
ESTN_UNIT
STRATUMCD
STRATUM_DESCR
EXPNS
ADJ_FACTOR_MACR
ADJ_FACTOR_SUBP
ADJ_FACTOR_MICR
ADJ_FACTOR_CWD
POP_ESTN_UNIT
*
CN
EVAL_CN
RSCD
STATECD
EVALID
ESTN_UNIT
ESTN_UNIT_DESC
AREA_USED
AREALAND_EU
AREATOT_EU
AREA_SOURCE
P1PNTCNT_EU
POP_EVAL
*
CN
EVAL_GRP_CN
EVALID
EVAL_DESCR
RSCD
STATECD
LOCATION_NM
REPORT_YEAR_NM
LAND_ONLY
TIMBERLAND_ONLY
ESTN_METHOD
NOTES
POP_EVAL_GRP
*
CN
EVAL_GRP
EVAL_GRP_DESCR
RSCD
STATECD
NOTES
POP_EVAL_TYP
*
CN
STATECD
EVAL_TYP
EVAL_GRP_CN
EVAL_CN

Keys Presented with the Tables

Each summarized table in chapter 3 has a list of keys just below the bottom of the table. These keys are used to join data from different tables. The following provides a general definition of each kind of key.

Primary key

A single column in a table whose values uniquely identify each row in the table.
The primary key in each FIADB table is the CN column.

The following table lists commonly used table abbreviations that are used when creating a foreign key in a second table, using the abbreviation and '_CN' as the column name. In addition, when writing SQL queries, it is common to set tables to an alias—the abbreviations below are recommended aliases to use.
An example of primary and foreign keys is: in the PLOT table the primary key is CN, and in other tables it is a foreign key named PLT_CN.

Table Name	Table Abbreviation		Table Name	Table Abbreviation
SURVEY	SRV		POP_EVAL	PEV
COUNTY	CTY		POP_EVAL_GRP	PEG
PLOT	PLT		POP_EVAL_TYP	PET
PLOT_PNW	PLT2		POP_EVAL_ATTRIBUTE	PEA
COND	CND		POP_ESTN_UNIT	PEU
COND_PNW	CND2		POP_PLOT_STRATUM_ASSGN	PPSA
SUBPLOT	SBP		POP_STRATUM	PSM
SUBPLOT_PNW	SBP2			
SUBP_COND	SCD			
TREE	TRE		REF_SPECIES	SPC
TREE_PNW	TRE2		REF_SPECIES_GROUP	SPG
TREE_REGIONAL_BIOMASS	TRB		REF_FOREST_TYPE	RFT
SEEDLING	SDL		REF_FOREST_TYPE_GROUP	RFTG
SITETREE	SIT		REF_POP_EVAL_TYP_DESCR	PED
DWM_COARSE_WOODY_DEBRIS	DCW		REF_POP_ATTRIBUTE	PAE
DWM_DUFF_LITTER_FUEL	DDL		REF_UNIT	UNT
DWM_FINE_WOODY_DEBRIS	DFW		REF_STATE_ELEV	RSE
DWM_MICROPLOT_FUEL	DMF		REF_HABTYP_DESCRIPTION	RHN
DWM_RESIDUAL_PILE	DRP		REF_HAPTYP_PUBLICATION	RPN
DWM_TRANSECT_SEGMENT	DTS		REF_CITATION	CIT
DWM_COND_DWM_CALC	CDC		BOUNDARY	BND
VEG_SP_PNWRS	VSP			

Unique key

Multiple columns in a table whose values uniquely identify each row in a table. There can be one and only one row for each unique key value.

The unique key varies for each table. The unique key for the PLOT table is STATECD, INVYR, and PLOT. The unique key for the COND table is PLT_CN and CONDID.

The name of the unique key for each table is listed in the table description. It follows the nomenclature of 'TABLEABBREVIATION'_UK.

Natural key

A type of unique key made from existing attributes in the table. It is stored as an index in this data base.

Not all tables have a natural key. For example, there is no natural key in the PLOT table, rather the natural key and the unique key are the same. The natural key for the COND table is STATECD, INVYR, UNITCD, COUNTYCD, PLOT, and CONDID.

The name of the natural key for each table is listed in the table description. It follows the nomenclature of 'TABLEABBREVIATION'_NAT_I.

Foreign key

A column in a table that is used as a link to a matching column in another table.

A foreign key connects a record in one table to one and only one record in another table. Foreign keys are used both to link records between data tables and as a check (or constraint) to prevent "unrepresented data". For example, if there are rows of data in the TREE table for a specific plot, there needs to be a corresponding data row for that same plot in the PLOT table. A foreign key in the TREE table is the attribute PLT_CN, which links specific rows in the TREE table to one record in the PLOT table using the plot attribute CN.

A foreign key in the COND table is PLT_CN. There is always a match of the PLT_CN value to the CN value in the PLOT table.

The name of the foreign key for each table is listed in the table description. It follows the nomenclature of 'SOURCETABLEABBREVIATION'_'MATCHINGTABLEABBREVIATION'_FK, where the source table is the table containing the foreign key and the matching table is the table the foreign key matches. The foreign key usually matches the CN column of the matching table. Most tables have only one foreign key, but tables can have multiple foreign keys.

DATABASE TABLE DEFINITIONS

PLOT table (Descriptive data about the inventory plot area)

	Column Name	Descriptive Name	Data Type
1	CN (Primary key)	Plot table sequence number	Text
2	SRV_CN	Survey table sequence number	Text
3	CTY_CN	County table sequence number	Text
4	INVYR	Inventory year	Integer
5	MEASYEAR	Measurement year	Integer
6	STATECD	State code	Integer
7	UNITCD	Survey unit code	Integer
8	COUNTYCD	County code	Integer
9	PLOT	Phase 2 plot number	Integer
10	PLOT_STATUS_CD	Plot status code	Integer
11	PLOT_NONSAMPLE_REASN_CD	Plot nonsampled reason code	Integer
12	CONGCD	Congressional district code	Integer
13	DECLINATION	Declination	Real
14	DESIGNCD	Plot design code	Integer
15	ECOSUBCD	Ecological subsection code	Text
16	ECO_UNIT_PNW	Ecological unit, PNW	Text
17	ELEV	Elevation	Integer
18	INTENSITY	Intensity	Text
19	KINDCD	Sample kind code	Integer
20	LAT	Latitude (not exact)	Real
21	LON	Longitude (not exact)	Real
22	MACRO_BREAKPOINT_DIA	Macroplot breakpoint diameter	Integer
23	MANUAL	Manual (field guide) version number	Real
24	MEASMON	Measurement month	Integer
25	MEASDAY	Measurement day	Integer
26	MICROPLOT_LOC	Microplot location	Text
27	P2VEG_SAMPLING_STATUS_CD	P2 vegetation sampling status code	Integer
28	P2VEG_SAMPLING_LEVEL_ DETAIL_CD	P2 vegetation sampling level detail code	Integer
29	QA_STATUS	Quality assurance status	Integer
30	RDDISTCD	Horizontal distance to improved road	Integer
31	SAMP_METHOD_CD	Sample method code	Integer
32	SUBP_EXAMINE_CD	Subplots examined code	Integer
33	TOPO_POSITION_PNW	Topographic position, PNW	Text
34	WATERCD	Water on plot code	Integer

	Column Name	Descriptive Name	Data Type
35	CYCLE	Inventory cycle number	Integer
36	SUBCYCLE	Inventory subcycle number	Integer
37	P2PANEL	Phase 2 panel number	Integer
38	SUBPANEL	Subpanel	Integer
39	P3PANEL	Phase 3 panel number	Integer

1. CN — Sequence number. A unique number that identifies every record in the PLOT table. This column appears as PLT_CN in other FIA database tables and is one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. For example, to link the plot record in the PLOT table to each condition record in the COND table:
link PLOT**.CN** = COND.**PLT_CN**. See page 13+ for more details.

   When a plot is remeasured (after 10 years), the 2nd measurement will be assigned a new PLT_CN. Remeasured plot records have the PLT_CN of the 1st measurement stored in the column called PREV_PLT_CN. So, the first measurement plot record will have a unique CN and the second measurement record will have a unique CN.

2. SRV_CN — Survey sequence number. Foreign key linking the plot record to the survey record.

3. CTY_CN — County sequence number. Foreign key linking the plot record to the county record.

4. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

5. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

6. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
2	AK	Alaska
6	CA	California
41	OR	Oregon
53	WA	Washington

7. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

8. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

9. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of INVYR, STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use **CN** (see above) to identify unique plots in the inventory (called PLT_CN in other tables).

10. PLOT_STATUS_CD — Plot status code. A code that describes the sampling status of the plot.

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

11. PLOT_NONSAMPLE_REASN_CD

Plot nonsampled reason code. For entire plots that cannot be sampled, one of the following reasons is recorded. Coded when PLOT_STATUS_CD=3.

Code	Description
01	**Outside U.S.** boundary –Entire plot is outside of the U.S. border.
02	**Denied access** area – Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot.
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.
05	**Lost data** – Plot data file was discovered to be corrupt after a panel was completed and submitted for processing.
06	**Lost plot** – Entire plot cannot be found.
07	**Wrong location** – Previous plot can be found, but its placement is beyond the tolerance limits for plot location.
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. This code is for office use only.
09	**Dropped** intensified plot - Intensified plot dropped due to a change in grid density. This code used only by units engaged in intensification. This code is for office use only.
10	**Other** – Entire plot not sampled due to a reason other than one of the specific reasons already listed.
11	**Ocean** – Plot falls in ocean water below mean high tide line.

12. CONGCD — Congressional district code. A territorial division of a State from which a member of the U.S. House of Representatives is elected. Based on the current Census, congressional districts in the United States are apportioned to the States based on population; each State receives at least one congressional district. The congressional district code assigned to a plot (regardless of when it was measured) is for the most recent Congress; the assignment is made based on the plot's approximate coordinates. CONGCD is a four-digit number. The first two digits are the State FIPS code and the last two digits are the congressional district number. If a State has only one congressional district the congressional district number is 00. If a plot's congressional district assignment falls in a State other than the plot's actual State due to using the approximate coordinates, the congressional district code ends in 99. The CONGCD is based on fuzzed and swapped plot coordinates. This attribute is coded for the coterminous States and southeast Alaska, and is left blank (null) in all other instances. For more information about the coverage used to assign this attribute, see National Atlas of the United States (2005).

13. DECLINATION — Declination. The azimuth correction used to adjust magnetic north to true north. The PNW FIA unit has corrected all compass readings for true north. This field carries a decimal place because the USGS corrections are to the nearest ½ degree. DECLINATION is defined as: DECLINATION = (TRUE NORTH - MAGNETIC NORTH)

14. DESIGNCD — Plot design code. A code indicating the type of plot design used to collect the data. Refer to appendix B for a list of codes and descriptions

15. ECOSUBCD — Ecological subsection code. An area of similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities. Subsection boundaries usually correspond with discrete changes in geomorphology. Subsection information is used for broad planning and assessment. Subsection codes for the coterminous United States were developed as part of the "Forest Service Map of Provinces, Sections, and Subsections of the United States (Cleland and others 2007) (visit http://fsgeodata.fs.fed.us/other_resources/ecosubregions.html). For southeast and south coastal Alaska, the codes reflect equivalents to the Ecological sections as designated in the Nowacki, Gregory; Spencer, Page; Fleming, Michael; Brock, Terry; and Jorgenson, Torre. Ecoregions of Alaska: 2001. U.S. Geological Survey Open-File Report 02-297 (map). [Metadata] [Region Descriptions] [JPG] [ARCExport] (1.6Mb) [Shape] (3.3Mb). Ecoregions described in this publications were assigned codes equivalent to Ecological Sections by Dr. Greg Nowacki, co-author on both publications. A narrative of ecoregion descriptions is included in Spencer, Page; Nowacki, Gregory; Fleming, Michael; Brock, Terry; and Jorgenson, Torre. 2002. Home is where the habitat is. Arctic Research of the United States. Vol 16: 6-17. (http://www.nsf.gov/pubs/2003/nsf03021/nsf03021_2.pdf) The ECOSUBCD is based on fuzzed and swapped plot coordinates. This attribute is coded for the coterminous United States, southeast and south coastal Alaska, and is left blank (null) in all other instances.Plot design code. A code indicating the type of plot design used to collect the data.

16. ECO_UNIT_PNW — Ecological unit. Plots taken by PNW FIA are assigned to the ecological unit in which they are located. Certain units have stocking adjustments made to the plots that occur on very low productivity lands, which thereby reduces the estimated potential productivity of the plot. More information can be found in MacLean (1973).

17. ELEV — Elevation. The distance the plot is located above sea level, recorded in feet (NAD 83 datum). Negative values indicate distance below sea level. Elevation is stored to the nearest 100 feet.

18. INTENSITY — Intensity. A code used to identify federal base grid annual inventory plots and plots that have been added to intensify a particular sample. Under the federal base grid, one plot is collected in each theoretical hexagonal polygon, which is slightly more than 5,900 acres in size. Plots with INTENSITY = 1 are part of the federal base grid. In some instances, States and/or agencies have provided additional support to increase the sampling intensity for an area. Supplemental plots have INTENSITY set to higher numbers depending on the amount of plot intensification chosen .

19. KINDCD — Sample kind code. A code indicating the type of plot installation. Database users may also want to examine DESIGNCD to obtain additional information about the kind of plot being selected.

Code	Description
1	Initial installation of an annual inventory plot
2	Remeasurement of previously installed National design plot
3	Replacement of previously installed National design plot

20. LAT — Latitude. The approximate latitude of the plot in decimal degrees using NAD 83 datum. Actual plot coordinates cannot be released because of a Privacy provision enacted by Congress in the Food Security Act of 1985. Therefore, this attribute is approximately +/- 1 mile and, for annual inventory data, most plots are within +/- ½ mile. Annual data have additional uncertainty for private plots caused by swapping plot coordinates for up to 20% of the plots. In some cases, the county centroid is used when the actual coordinate is not available.

21. LON — Longitude. The approximate longitude of the plot in decimal degrees using NAD 83 datum. Actual plot coordinates cannot be released because of a Privacy provision enacted by Congress in the Food Security Act of 1985. Therefore, this attribute is approximately +/- 1 mile and, for annual inventory data, most plots are within +/- ½ mile. Annual data have additional uncertainty for private plots caused by swapping plot coordinates for up to 20% of the plots. In some cases, the county centroid is used when the actual coordinate is not available.

22. MACRO_BREAKPOINT_DIA — Macroplot breakpoint diameter. (*Core optional*). A macroplot breakpoint diameter is the diameter (either DBH or DRC) above which trees are measured on the plot extending from 0.01 to 58.9 feet horizontal distance from the center of each subplot. Installation of macroplots is core optional and is used to have a larger plot size in order to more adequately sample large trees. If macroplots are not being installed, this item will be left blank (null). See the next page for details on actual diameters and plot sizes.

The PNW uses the ***Macroplot*** to sample large trees in California, most of Oregon, and Washington (these plots are identified by COND.PROP_BASIS="MACR"). We use a set of breakpoint diameters to determine what size trees to tally within the ring between the subplot and macroplot. This affects the way we calculate TPA for larger trees in each state as follows:

State or Halfstate	MACRO_ BREAKPOINT_DIA	Minimum Diameter (DIA)	Maximum Diameter (DIA)	Plot size used to calculate TPA	Trees per acre for a tree sampled on this plot size (TPA_UNADJ)
	inches	inches	inches		
California	**24**	5	23.9	Subplot	6.018046
California	**24**	24	any	Macroplot	0.999188
Eastern Oregon	**24**	5	23.9	Subplot	6.018046
Eastern Oregon	**24**	24	any	Macroplot	0.999188
Western Oregon	**30**	5	29.9	Subplot	6.018046
Western Oregon	**30**	30	any	Macroplot	0.999188
Eastern Washington	**24**	5	23.9	Subplot	6.018046
Eastern Washington	**24**	24	any	Macroplot	0.999188
Western Washington	**30**	5	29.9	Subplot	6.018046
Western Washington	**30**	30	any	Macroplot	0.999188

23. MANUAL — Manual (field guide) version number. Version number of the Field Guide used to describe procedures for collecting data on the plot. The National FIA Field Guide began with Version 1.0; therefore data taken using the National Field procedures will have PLOT.MANUAL ≥ 1.0.

24. MEASMON — Measurement month. The month in which the plot was completed.

Code	Description	Code	Description
01	January	07	July
02	February	08	August
03	March	09	September
04	April	10	October
05	May	11	November
06	June	12	December

25. MEASDAY — Measurement day. The day of the month in which the plot was completed.

26. MICROPLOT_LOC — Microplot location. Values are 'OFFSET' or 'CENTER'. The offset microplot center is located 12 feet due east (90 degrees) of subplot center. The current standard is that the microplot is located in the 'OFFSET' location, but some earlier inventories, including some early panels of the annual inventory, may contain data where the microplot was located at the 'CENTER' location.

27. P2VEG_SAMPLING_STATUS_CD

P2 vegetation sampling status code. A code indicating whether vegetation data were recorded on the plot and the land class(es) on which the data were recorded.

Code	Description
0	Not sampling vegetation
1	Vegetation data collected only on accessible forest land conditions
2	Vegetation data collected on all accessible land conditions

28. P2VEG_SAMPLING_LEVEL_DETAIL_CD

P2 vegetation sampling level detail code. Level of detail (LOD). A code indicating whether data were collected for vegetation structure growth habits only, or for individual species (that qualify as most abundant) as well. If LOD = 3, then a tree species could be recorded twice, but it would have two different species growth habits.

Code	Description
1	Data collected for vegetation structure only; total aerial cover and cover by layer for tally tree species (all sizes), non-tally tree species (all sizes), shrubs, forbs, and graminoids.
2	Vegetation structure data (LOD = 1) **plus** understory species composition data collected including up to four species of: seedlings and saplings of any tree species (tally or non-tally) <5 inches DBH (DRC for woodland species), shrubs (including woody vines), forbs, and grasses.
3	Vegetation structure data, understory species composition data (LOD = 2), **plus** up to four trees species (tally or non-tally) ≥5 inches DBH (DRC for woodland species) collected.

29. QA_STATUS

Quality assurance status. A code indicating the type of plot data collected. Populated for all forested subplots .

Code	Description
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	Production plot (hot check)

30. RDDISTCD

Horizontal distance to improved road code. The straight-line distance from plot center to the nearest improved road, which is a road of any width that is maintained as evidenced by pavement, gravel, grading, ditching, and/or other improvements. Populated for all forested plots.

Code	Description	Code	Description
1	100 ft or less	6	1/2 to 1 mile
2	101 ft to 300 ft	7	1 to 3 miles
3	301 ft to 500 ft	8	3 to 5 miles
4	501 ft to 1000 ft	9	Greater than 5 miles
5	1001 ft to 1/2 mile		

31. SAMP_METHOD_CD

Sample method code. A code indicating if the plot was observed in the field or remotely sensed in the office.

Code	Description
1	**Field visited**, meaning a field crew physically examined the plot and recorded information at least about subplot 1 center condition (see SUBP_EXAMINE_CD below)
2	**Remotely sensed**, meaning a determination was made using some type of imagery that a field visit was not necessary. When the plot is sampled remotely, the number of subplots examined (SUBP_EXAMINE_CD) usually equals 1.

32. SUBP_EXAMINE_CD

Subplots examined code. A code indicating the number of subplots examined. By default, PLOT_STATUS_CD = 1 plots have all 4 subplots examined.

Code	Description
1	Only subplot 1 center condition examined and all other subplots assumed (inferred) to be the same
4	All four subplots fully described (no assumptions/inferences)

33. TOPO_POSITION_PNW

Topographic position, Pacific Northwest Research Station. The topographic position that describes the plot area. Illustrations available in Plot section of PNW field manual. Only collected by PNW.

Code	Topographic Position	Common shape of slope
1	Ridge top or mountain peak over 130 feet	Flat
2	Narrow ridge top or mtn peak over 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

34. WATERCD — Water on plot code. Water body less than 1 acre in size or a stream less than 30 feet wide that has the greatest impact on the area within the forest land portion of the four subplots. The coding hierarchy is listed in order from large permanent water to temporary water. Populated for all forested plots.

Code	Description
0	None - no water sources within the accessible forest land condition class
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 in size, or with standing trees
3	Ditch/canal – human made channels used as a means of moving water, e.g., for 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
8	Census or noncensus water
9	Other temporary water – specified in plot-level notes.

35. CYCLE — Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained.

36. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

37. P2PANEL — Phase 2 panel number. Forest Inventory and Analysis panel number. The value for P2PANEL ranges from 1 to 5 for annual inventories. A panel is a sample in which the same elements are measured on two or more occasions. FIA divides the plots in each State into 5 panels that can be used to independently sample the population.

38. SUBPANEL — Subpanel. Subpanel assignment for the plot for those FIA work units using subpaneling. FIA uses a 5-panel system (see P2PANEL) to divide plot sampling over a 5-year period. Funding for western FIA work units is only sufficient to allow plot sampling over a 10-year period. Therefore, panels are further divided into subpanels.

39. P3PANEL — Phase 3 panel number. A panel is a sample in which the same elements are measured on two or more occasions. FIA divides the plots in each State into 5 panels that can be used to independently sample the population. The value for P3PANEL ranges from 1 to 5 for those plots where phase 3 data were collected. If the plot is not a phase 3 plot, then this attribute is left blank (null).

PLOT_PNW table (PNW regional plot table, contains expansion factors and adjustment factors for current estimates of area, volume, biomass)
PLOT_PNW_2010 table (PNW regional plot table, for DWM estimates for the years 2001-2010 for California and Oregon, or 2002-2011 for Washington)

Contains new columns that help simplify creating and running queries from the database. Includes expansion factors and adjustment factors from the POPulation tables that are needed to summarize FIA data.
The table is only available in the PNW-FIADB created by the PNW FIA work unit.

	Column Name	Descriptive Name	Data Type
1	PLT_CN	Sequence number	Text
2	INVYR	Inventory year	Integer
3	MEASYEAR	Measurement year	Integer
4	STATECD	State code	Integer
5	STATEAB	State abbreviation	Text
6	STATENM	State name	Text
7	PLOT	Phase 2 plot number	Integer
8	PLOT_STATUS_CD	Plot status code	Integer
9	HALFSTATE_OreWash	Code for East or West of the Cascades	Text
10	HALFSTATE_Name	East or West of the Cascades description text	Text
11	SURVEY_UNIT_CD	Survey unit code	Integer
12	SURVEY_UNIT_NAME	Survey unit name	Text
13	EXPCURR	Plot expansion factor (acres) for AREA estimates of sampled land, for the current stratification	Real
14	EXPVOL	Plot expansion factor (acres) for TREE or DWM estimates on sampled forest land, for the current stratification	Real
15	EXPALL	Plot expansion factor for AREA estimates on ALL land (sampled and unsampled) (rarely used), for the current stratification	Real
16	ADJ_FACTOR_EXPCURR	Adjustment factor to estimate sampled land area	Real
17	ADJ_FACTOR_MACR	Adjustment factor for the macroplot (tree estimates)	Real
18	ADJ_FACTOR_SUB	Adjustment factor for the subplot (tree estimates)	Real
19	ADJ_FACTOR_MICR	Adjustment factor for the microplot (tree estimates)	Real
20	ADJ_FACTOR_CWD	Adjustment factor for CWD estimates	Real
21	ADJ_FACTOR_FWD_SM	Adjustment factor for small & medium sized FWD estimates	Real
22	ADJ_FACTOR_FWD_LG	Adjustment factor for large sized FWD estimates	Real
23	ADJ_FACTOR_DUFF	Adjustment factor for duff estimates	Real
24	PROP_BASIS	Proportion basis	Text
25	PNW_PANEL	Panel number for the PNW (panels 1-10)	Integer
26	INVYR_ORIG_AK	Inventory year originally recorded for Alaska on some plots	Integer

1. PLT_CN — Plot sequence number. Foreign key linking the PLOT_PNW record to the plot record in other tables. It is a unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Use this to link the PLOT_PNW table to the PLOT table. An individual plot may have 2 PLT_CN's if the plot was remeasured.

   When a plot is remeasured (after 10 years), the 2nd measurement will be assigned a new PLT_CN. Remeasured plot records have the PLT_CN of the 1st measurement stored in the column PREV_PLT_CN.

2. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

3. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

4. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
2	AK	Alaska
6	CA	California
41	OR	Oregon
53	WA	Washington

5. STATEAB — State abbreviation. The two-character State abbreviation. See STATECD definition.

6. STATENM — State name. See STATECD definition.

7. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

8. PLOT_STATUS_CD — Plot status code. A code that describes the sampling status of the plot.

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

9. HALFSTATE_OreWash

Identifies whether a plot is installed on the east or west side of the Cascade Mountains. For Oregon and Washington plots only

.

HALFSTATE_OreWash	HALFSTATE_NAME	STATECD	STATENM
EOR	Eastern Oregon	**41**	Oregon
WOR	Western Oregon	**41**	Oregon
EWA	Eastern Washington	**53**	Washington
WWA	Western Washington	**53**	Washington

10. HALFSTATE_NAME The written name for the side of the cascade mountains where the plot is located. For Oregon and Washington only. The short code is stored in HALFSTATE_OreWash

11. SURVEY_UNIT_CD A code that identifies the survey unit in a state. Each Unit consists of a group of counties.

STATECD	SURVEY_UNIT_CD	SURVEY_UNIT_NAME
2	1	Alaska
6	1	North Coast
6	2	North Interior
6	3	Sacramento
6	4	Central Coast
6	5	San Joaquin
6	6	Southern
41	0	Northwest
41	1	West Central
41	2	Southwest
41	3	Central
41	4	Blue Mountains
53	5	Puget Sound
53	6	Olympic Peninsula
53	7	Southwest
53	8	Central
53	9	Inland Empire

12. SURVEY_UNIT _NAME The written name for the survey unit (see table above).

13. EXPCURR — Plot expansion factor (acres) for current AREA estimates on sampled land. The number of acres the sample plot represents for estimating current forest land, timberland and nonforest area. In this table, EXPCURR is based on the Evalid that includes only the sampled plots (i.e. excludes outside-of-the-population, denied-access, and hazardous plots). Use this column to summarize land area.

    When EVALID= 4,5,6,102 then EXPCURR= POP_STRATUM.EXPNS
    To calculate area, use the formula:
    EXPCURR*CONDPROP_UNADJ*ADJ_FACTOR_EXPCURR

14. EXPVOL — Volume expansion factor (acres) for current TREE attribute estimates (Volume, Biomass, Number of Trees, etc) or DWM estimates on sampled forest land. The number of acres the sample plot represents for estimating current volume, biomass, number of trees, number of down wood logs, down wood biomass, or any other tree or DWM per-acre value.

    EXPVOL is based on the Evalid that includes only the sampled plots.
    When EVALID= 4,5,6,102 then EXPVOL= POP_STRATUM.EXPNS

    For example, to calculate net volume, use the formula:
    VOLCFNET*EXPVOL*TPA_UNADJ*(ADJ_FACTOR_MACR, ADJ_FACTOR_SUB, or ADJ_FACTOR_MICR)
    See the definitions of ADJ_FACTOR_MACR, ADJ_FACTOR_SUB, or ADJ_FACTOR_MICR for more information on these factors.

    Alternatively, use the adjusted TPA in the TREE_PNW table.
    VOLCFNET * EXPVOL * TREE_PNW.TPA_ADJ

15. EXPALL — Plot expansion factor for AREA estimates that include ALL land (sampled and unsampled). The number of acres the plot represents for estimating current land area that includes denied-access and hazardous plots, but excludes outside-of-the-population plots. Using this expansion factor will give you estimates of forest and nonforest land area as well as an estimate of land area that was not sampled. This expansion factor is rarely used.
    When EVALID= 1,2,3,101 then EXPALL= POP_STRATUM.EXPNS

16. ADJ_FACTOR_EXPCURR
    Adjustment factor needed to estimate and summarize sampled land area. This adjustment factor should be applied to the CONDPROP_UNADJ on the condition record when generating population estimates of area. The factor takes into account the PROP_BASIS, and “out of population” and “denied access” portions of conditions within the stratum.
    The factor was populated as follows:
    ADJ_ FACTOR _EXPCURR = POP_STRATUM.ADJ_FACTOR_MACR when PROP_BASIS=MACR
    or
    ADJ_ FACTOR _EXPCURR = POP_STRATUM.ADJ_FACTOR_SUBP when PROP_BASIS=SUBP
    To calculate area, use the formula
    EXPCURR * CONDPROP_UNADJ * ADJ_FACTOR_EXPCURR

17. ADJ_FACTOR_MACR

Adjustment factor for the macroplot. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. This adjustment factor should be applied to large trees when generating population estimates for **tree** attributes (i.e. volume, biomass, carbon). Multiply TPA_UNADJ by ADJ_FACTOR_MACR when the DIA >= PLOT.MACRO_BREAKPOINT_DIA. (Note that MACRO_BREAKPOINT_DIA only contains a value when PROP_BASIS = MACR). If a macroplot was not installed, this attribute is left blank (null).

Or, in the annual inventory, another way to check which adjustment factor to use for tree attributes is shown below:
If [TREE].[TPA_UNADJ] = 0.999188 use [ADJ_FACTOR_MACR]
If [TREE].[TPA_UNADJ] = 6.018046 use [ADJ_FACTOR_SUBP]
If [TREE].[TPA_UNADJ] = 74.965282 use [ADJ_FACTOR_MICR]

For example: net cubic volume of a 48" DIA tree on a plot with a MACRO_BREAKPOINT_DIA = 24" is calculated as follows ---
[VOLCFNET] * [TPA_UNADJ] * [ADJ_FACTOR_MACR] * [EXPVOL]

In the national database, this adjustment factor is also applied to the CONDPROP_UNADJ on the condition record when generating population estimates of area, if PROP_BASIS = MACR.

However, when using PLOT_PNW table in the PNW-FIADB database, the appropriate adjustment factor (based on the PROP_BASIS) has already been stored in the column ADJ_FACTOR_EXPCURR. It is not necessary to check the PROP_BASIS in your calculations – you can just use ADJ_FACTOR_EXPCURR to estimate area.
For example**: Acres = [EXPCURR]*[CONDPROP_UNADJ]*[ADJ_FACTOR_EXPCURR]**

18. ADJ_FACTOR_SUBP

Adjustment factor for the subplot. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. This adjustment factor should be applied to the tree record when generating population estimates for **tree** attributes (i.e. volume, biomass, carbon). Multiply TPA_UNADJ by ADJ_FACTOR_SUBP when the DIA >=5" and less than the PLOT.MACRO_BREAKPOINT_DIA. If the PROP_BASIS = "SUBP" as in all plots in Alaska, this factor should be used on all trees with DIA >= 5". In the annual inventory, another way to check which adjustment factor to use for tree attributes is as follows:
If [TREE].[TPA_UNADJ] = 6.018046 use [ADJ_FACTOR_SUBP]

For example: net cubic volume of a 16" DIA tree on a plot with a MACRO_BREAKPOINT_DIA = 24" is calculated as follows:
[VOLCFNET] * [TPA_UNADJ] * [ADJ_FACTOR_SUBP] *[EXPVOL]

In the national database, this adjustment factor is also applied to the CONDPROP_UNADJ on the condition record when generating population estimates of area, if PROP_BASIS = SUBP.

However, when using PLOT_PNW table in the PNW-FIADB database, the appropriate adjustment factor (based on the PROP_BASIS) has been stored in the column ADJ_FACTOR_EXPCURR. It is not necessary to check the PROP_BASIS in your calculations – you can just use ADJ_FACTOR_EXPCURR to estimate area.
For example : **Acres = [EXPCURR]*[CONDPROP_UNADJ]*[ADJ_FACTOR_EXPCURR]**

19. ADJ_FACTOR_MICR

    Adjustment factor for the microplot. A value that adjusts population estimates to account for partially nonsampled plots (access denied and hazardous portions). This adjustment factor is applied to the seedling or sapling tree record when generating population estimates for **tree** attributes. For example, ADJ_FACTOR_MICR should be applied to the TPA_UNADJ on any tree with a DIA >=1" and <5" .
    In the annual inventory, another way to check which adjustment factor to use is as follows: If [TREE].[TPA_UNADJ]=74.965282 use [ADJ_FACTOR_MICR]

20. ADJ_FACTOR_CWD Adjustment factor for CWD estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. The factor is a ratio of CWD transect length that was sampled vs. the total transect length as defined in the sampling design. This adjustment factor should be applied to the various unadjusted columns in the DWM_COND_DWM_CALC and DWM_COARSE_WOODY_DEBRIS tables when generating population estimates for CWD attributes (i.e. volume, biomass, carbon, number of logs).

21. ADJ_FACTOR_FWD_SM

    Adjustment factor for small and medium FWD estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. The factor is a ratio of FWD transect length that was sampled vs. the total transect length as defined in the sampling design This adjustment factor should be applied to the various unadjusted columns in the DWM_COND_DWM_CALC and DWM_FINE_WOODY_DEBRIS tables when generating population estimates for small and medium FWD attributes (i.e. volume, biomass, carbon).

22. ADJ_FACTOR_FWD_LG

    Adjustment factor for large FWD estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. The factor is a ratio of FWD transect length that was sampled vs. the total transect length as defined in the sampling design. This adjustment factor should be applied to the various unadjusted columns in the DWM_COND_DWM_CALC and DWM_FINE_WOODY_DEBRIS tables when generating population estimates for large FWD attributes (i.e. volume, biomass, carbon).

23. ADJ_FACTOR_DUFF Adjustment factor for duff estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located.

24. PROP_BASIS — Proportion basis. A value indicating what type of fixed-size subplots were installed when this plot was sampled. This information is needed in order to use the proper adjustment factor for the stratum in which the plot occurs. Usually, in most of PNW, the 58.9-foot radius macroplots are installed, and the value is "MACR". In Alaska, 24-foot radius subplots are installed and in this case, the value for PROP_BASIS is "SUBP". When summarizing land area, if PROP_BASIS = "MACR" then use POP_STRATUM.ADJ_FACTOR_MACR ; or if PROP_BASIS = "SUBP" then use POP_STRATUM.ADJ_FACTOR_SUBP to adjust the land area estimate to account for partially unsampled plots in the stratum.

    Alternatively, use PLOT_PNW.ADJ_FACTOR_EXPCURR for every condition, regardless of the PROP_BASIS value. The correct adjustment factor has already been stored in this column.

25. PNW_PANEL — The panel number for PNW. This is a combination of PANEL and SUBPANEL. Values range from 1-10.

Note:

The PLOT_PNW table is based on EVALID's numbered 4, 5, 6, 102, 1, 2, 3, 101. These codes identify a set of field plots for the most recent 10 years of data. This table should be used to calculate population estimates for the current 10-year period.

The PLOT_PNW_2010 table is based on EVALID's numbered 40110, 50110 and 60211. In the database, this set of EVALID's is for the years 2001-2010 for California and Oregon, and 2002-2011 for Washington—they are used for DWM estimation. The DWM protocol changed in 2011 (CAOR) and in 2012 (WA) and new tables structures were not yet available. Therefore to summarize DWM, use the PLOT_PNW_2010 table to link to DWM tables via PLT_CN to pull out the correct set of plots. Use the expansion factors and adjustment factors on this table for DWM estimation.

COND table (Condition Table: A table of condition attributes)

	Column Name	Descriptive Name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CONDID	Condition class number	Integer
4	INVYR	Inventory year	Integer
5	STATECD	State code	Integer
6	UNITCD	Survey unit code	Integer
7	COUNTYCD	County code	Integer
8	PLOT	Phase 2 plot number	Integer
9	COND_STATUS_CD	Condition status code	Integer
10	COND_NONSAMPLE_REASN_CD	Condition nonsampled reason code	Integer
11	RESERVCD	Reserved status code	Integer
12	SITECLCD	Site productivity class code	Integer
13	CONDPROP_UNADJ	Condition proportion unadjusted	Real
14	MACRPROP_UNADJ	Macroplot proportion unadjusted	Real
15	SUBPPROP_UNADJ	Subplot proportion unadjusted	Real
16	MICRPROP_UNADJ	Microplot proportion unadjusted	Real
17	ADFORCD	Administrative forest code	Integer
18	ALSTK	All-live-tree stocking percent	Real
19	ALSTKCD	All live stocking code	Integer
20	ASPECT	Aspect	Integer
21	BALIVE	Basal area per acre of live trees	Real
22	CARBON_LITTER	Carbon in litter, modeled	Real
23	CARBON_SOIL_ORG	Carbon in soil organic material, modeled	Real
24	CARBON_UNDERSTORY_AG	Carbon -- understory aboveground, modeled	Real
25	CARBON_UNDERSTORY_BG	Carbon -- understory belowground, modeled	Real
26	DSTRBCD1	Disturbance 1 code	Integer
27	DSTRBCD2	Disturbance 2 code	Integer
28	DSTRBCD3	Disturbance 3 code	Integer
29	DSTRBYR1	Disturbance year 1	Integer
30	DSTRBYR2	Disturbance year 2	Integer
31	DSTRBYR3	Disturbance year 3	Integer
32	FLDAGE	Field-call, stand age	Integer
33	FLDSZCD	Field-call, stand-size class code	Integer
34	FLDTYPCD	Field-call, forest type code	Integer
35	FORTYPCD	Forest type code, calculated	Integer
36	FORTYPCDCALC	Forest type code, original algorithm result	Integer
37	GROUND_LAND_CLASS_PNW	Present ground class	Text

	Column Name	Descriptive Name	Data type
38	GSSTK	Growing-stock stocking percent	Real
39	GSSTKCD	Growing-stock stocking code	Integer
40	HABTYPCD1	Habitat type code 1	Text
41	HABTYPCD1_PUB_CD	Habitat type code 1 publication	Text
42	MAPDEN	Mapping density	Integer
43	MIXEDCONFCD	Mixed conifer code	Text
44	OWNCD	Owner class code	Integer
45	OWNGRPCD	Owner group code	Integer
46	PHYSCLCD	Physiographic class code	Integer
47	PLANT_STOCKABILITY_ FACTOR_PNW	Plant stockability factor	Integer
48	PRESNFCD	Present nonforest code	Integer
49	PROP_BASIS	Proportion basis	Text
50	SIBASE	Site index base age	Integer
51	SICOND	Site index for the condition	Integer
52	SISP	Site index species code	Integer
53	SITECLCDEST	Site productivity class code estimated	Integer
54	SITECL_METHOD	Site class method	Integer
55	SLOPE	Slope	Integer
56	SOIL_ROOTING_DEPTH_PNW	Soil rooting depth	Text
57	STDAGE	Stand age	Integer
58	STDSZCD	Stand-size class code	Integer
59	STDORGCD	Stand origin code	Integer
60	STDORGSP	Stand origin species code	Integer
61	STND_COND_CD_PNWRS	Stand condition code	Integer
62	STND_STRUC_CD_PNWRS	Stand structure code	Integer
63	STUMP_CD_PNWRS	Stump code, PNW	Text
64	TRTCD1	Stand treatment 1 code	Integer
65	TRTCD2	Stand treatment 2 code	Integer
66	TRTCD3	Stand treatment 3 code	Integer
67	TRTYR1	Treatment year 1	Integer
68	TRTYR2	Treatment year 2	Integer
69	TRTYR3	Treatment year 3	Integer
70	VOL_LOC_GRP	Volume location group for equations	Text
71	CANOPY_CVR_SAMPLE_METHOD_CD	Canopy cover sample method code	Real
72	LIVE_CANOPY_CVR_PCT	Live canopy cover percent	Real
73	LIVE_MISSING_CANOPY_CVR_PCT	Live plus missing canopy cover percent	Real
74	NBR_LIVE_STEMS	Number of live stems	Real
75	CYCLE	Inventory cycle number	Integer
76	SUBCYCLE	Inventory subcycle number	Integer

1. CN — Sequence number. A unique number used to identify a condition record. This will appear as CND_CN in other tables.

2. PLT_CN — Plot sequence number. Foreign key linking the condition record to the plot record. A unique number that identifies every record in the PLOT table. It is also a foreign key linking the records in this table to the plot record in any other table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Link COND.PLT_CN = PLOT.CN. See page 13+ for more details.
When a plot is remeasured (after 10 years), the 2nd measurement will be assigned a new PLT_CN. Remeasured plot records have the PLT_CN of the 1st measurement stored in the column PREV_PLT_CN. So, the first measurement plot record will have a unique CN and the second measurement record will have a unique CN.

3. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot. Use the combination of PLT_CN and CONDID to link to other tables (i.e. TREE table).

4. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

7. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

8. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use the single column PLT_CN to identify unique plots in the inventory, within one measurement cycle (a 10-year period). When a plot is remeasured (after 10 years), the 2nd measurement will be assigned a new PLT_CN. Remeasured plot records have the PLT_CN of the 1st measurement stored in the column PREV_PLT_CN.

9. COND_STATUS_CD — Condition status code. A code indicating the basic land cover.

Code	Description
1	**Forest land**: Accessible land with at least 10 percent cover (or equivalent stocking) by live trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. To qualify, the area must be at least 1.0 acre in size and 120.0 feet wide. Forest land includes transition zones, such as areas between forest and nonforest lands that have at least 10% cover (or equivalent stocking) with live trees and forest areas adjacent to urban and built-up lands. Roadside, streamside, and shelterbelt strips of trees must have a width of at least 120 feet and continuous length of at least 363 feet to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if they are < 120 feet wide or an acre in size. Tree-covered areas in agricultural production settings, such as fruit orchards, or tree-covered areas in urban settings, such as city parks, are not considered forest land.
2	**Nonforest land**: Any land within the sample that does not meet the definition of accessible forest land or any of the other types of basic land classifications. To qualify, the area must be at least 1.0 acre in size and 120.0 feet wide, with some exceptions that are described in the document “Forest inventory and analysis national core field guide, volume 1: field data collection procedures for Phase 2 plots, version 5.1”. Evidence of "possible" or future development or conversion is not considered. A nonforest land condition will remain in the sample and will be examined at the next occasion to see if it has become forest.
3	**Noncensus water**: Lakes, reservoirs, ponds, and similar bodies of water 1.0 acre to 4.5 acre in size. Rivers, streams, canals, etc., 30 ft to 200 ft wide (1990 U.S. Census definition – U.S. Census Bureau 1994).
4	**Census water**: Lakes, reservoirs, ponds, and similar bodies of water 4.5 acre in size and larger; and rivers, streams, canals, etc., more than 200 feet wide (1990 U.S. Census definition – U.S. Census Bureau 1994).
5	**Nonsampled, with possibility of forest land present:** Any portion of a plot within accessible forest land that cannot be sampled is delineated as a separate condition. There is no minimum size requirement. The reason the condition was not sampled is provided in COND_NONSAMPLE_REASN_CD.

10. COND_NONSAMPLE_REASN_CD

Condition nonsampled reason code. For condition classes (COND_STATUS_CD=5) that cannot be sampled, one of the following reasons is recorded.

Code	Description
01	Outside U.S. boundary – Condition class is outside the U.S. border.
02	Denied access area – Access to the condition class is denied by the legal owner, or by the owner of the only reasonable route to the plot.
03	Hazardous situation – Condition class cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc.
05	Lost data – The data file was discovered to be corrupt after a panel was completed and submitted for processing. This code is assigned to condition classes on subplots (or macroplots) that could not be processed.
06	Lost plot – Entire plot cannot be found. Used for the single condition that is required for this plot.
07	Wrong location – Previous plot can be found, but its placement is beyond the tolerance limits for plot location. Used for the single condition that is required for this plot.
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. Used for the single condition that is required for this plot. This code is for office use only.
09	Dropped intensified plot - Intensified plot dropped due to a change in grid density. Used only by units engaged in intensification. This code is for office use only.
10	Other – Not sampled for other reasons.
11	Ocean – Condition falls in ocean water below mean high tide line.

11. RESERVCD

Reserved status code. (O*ptional for nonforest land.*) Reserved land is land that is withdrawn by law(s) prohibiting the management of the land for the production of wood products. Timberland is always RESERVCD=0.

Code	Description
0	Not reserved
1	Reserved

12. SITECLCD — Site productivity class code. A classification of forest land in terms of inherent capacity to grow crops of industrial wood. Identifies the potential growth in cubic feet/acre/year and is based on the culmination of mean annual increment of fully stocked natural stands. This variable may either be assigned based on the site trees available for the plot, or, if no valid site trees are available, this variable is set equal to SITECLCDEST, an estimated or predicted site productivity class. If SITECLCDEST is used to populate SITECLCD, the variable SITECL_METHOD is set to 6.

    Timberland always has a SITECLCD < 7.

Code	Description
1	225 + cubic feet/acre/year
2	165 - 224 cubic feet/acre/year
3	120 - 164 cubic feet/acre/year
4	85 - 119 cubic feet/acre/year
5	50 - 84 cubic feet/acre/year
6	20 - 49 cubic feet/acre/year
7	0 - 19 cubic feet/acre/year

13. CONDPROP_UNADJ — Condition proportion unadjusted. The unadjusted proportion of the plot that is in the condition. This variable is retained for ease of area calculations. It is equal to either SUBPPROP_UNADJ or MACRPROP_UNADJ, depending on the value of PROP_BASIS. The sum of all condition proportions for a plot = 1. When generating population area estimates, this proportion is adjusted by either the POP_STRATUM.ADJ_FACTOR_MACR or the ADJ_FACTOR_SUBP to account for partially nonsampled plots (access denied or hazardous portions).

14. MACRPROP_UNADJ — Macroplot proportion unadjusted. The unadjusted proportion of the macroplots that are in the condition. When macroplots are installed, the sum of all macroplot condition proportions for a plot = 1; otherwise this attribute is left blank (null).

15. SUBPPROP_UNADJ — Subplot proportion unadjusted. The unadjusted proportion of the subplots that are in the condition. The sum of all subplot condition proportions for a plot = 1. This is the sum of SUBPCOND_PROP from the SUBP_COND table divided by 4.

16. MICRPROP_UNADJ — Microplot proportion unadjusted. The unadjusted proportion of the microplots that are in the condition. The sum of all microplot condition proportions for a plot = 1.

17. ADFORCD — Administrative forest code. Identifies the administrative unit (Forest Service Region and National Forest) in which the condition is located. The first two digits of the four digit code are for the region number and the last two digits are for the Administrative National Forest number. Refer to appendix E for codes. Populated for U.S. Forest Service lands OWNGRPCD = 10 and blank (null) for all other owners, except in a few cases where an administrative forest manages land owned by another federal agency; in this case OWNGRPCD = 20 and ADFORCD >0.

18. ALSTK — All-live-tree stocking percent. The sum of stocking percent values of all live trees on the condition. The percent is then assigned to a stocking class, found in ALSTKCD.

19. ALSTKCD — All live stocking code. A code indicating the stocking of the condition by live trees, including seedlings. Data are in classes as shown below.

Code	Description	
1	Overstocked	(100+ %)
2	Fully stocked	(60 – 99%)
3	Medium stocked	(35 – 59%)
4	Poorly stocked	(10 – 34%)
5	Nonstocked	(0 – 9%)

20. ASPECT — Aspect. The direction of slope, to the nearest degree, for most of the condition. North is recorded as 360. When slope is less than 5 percent, there is no aspect and this item is set to zero. Aspect is collected on subplots but no longer collected for conditions. NOTE: the aspect from the subplot representing the greatest percentage of the condition is assigned to this condition record. In the event that two or more subplots represent the same percentage of area in the condition, the aspect from the lower numbered subplot is used. Populated for all forest annual plots.

21. BALIVE — Basal area of live trees in the condition. Unadjusted basal area in square feet per acre of all live trees over 1 inch DBH/DRC sampled in the condition. Note this column should be used only when a fully condition based per-acre estimate is needed, for example, when modeling. It should not be used to estimate population totals, rather use BASAL_AREA on the TREE_PNW table.

22. CARBON_LITTER — Carbon in litter. Carbon (tons per acre) of organic material on the floor of the forest, including fine woody debris, humus, and fine roots in the organic forest floor layer above mineral soil. Estimated from **models** based on geographic area, forest type, and (except for nonstocked and pinyon-juniper stands) stand age (Smith and Heath 2002). This modeled attribute is a component of the EPA's Greenhouse Gas Inventory and is not a direct sum of Phase 2 or Phase 3 measurements. This is a per acre estimate and must be multiplied by the appropriate expansion and condition proportion adjustment factor located in the POP_STRATUM or PLOT_PNW table.

23. CARBON_SOIL_ORG — Carbon in organic soil. Carbon (tons per acre) in fine organic material below the soil surface to a depth of 1 meter. Does not include roots. Estimated from **models** based on geographic area and forest type (Smith and Heath 2008). This modeled attribute is a component of the EPA's Greenhouse Gas Inventory and is not a direct sum of Phase 2 or Phase 3 measurements. This is a per acre estimate and must be multiplied by the appropriate expansion and condition proportion adjustment factor located in the POP_STRATUM or PLOT_PNW table.

24. CARBON_UNDERSTORY_AG — Carbon in understory aboveground. Carbon (tons per acre) in the aboveground portions of seedlings, shrubs, and bushes. Estimated from **models** based on geographic area, forest type, and (except for nonstocked and pinyon-juniper stands) live tree carbon density (Smith and Health 2008). This modeled attribute is a component of the EPA's Greenhouse Gas Inventory and is not a direct sum of Phase 2 or Phase 3 measurements. This is a per acre estimate and must be multiplied by the appropriate expansion and condition proportion adjustment factor located in the POP_STRATUM or PLOT_PNW table.

25. CARBON_UNDERSTORY_BG

Carbon in understory belowground. Carbon (tons per acre) in the belowground portions of seedlings, shrubs, and bushes. Estimated from **models** based on geographic area, forest type, and (except for nonstocked and pinyon-juniper stands) live tree carbon density (Smith and Heath 2008). This modeled attribute is a component of the EPA's Greenhouse Gas Inventory and is not a direct sum of Phase 2 or Phase 3 measurements. This is a per acre estimate and must be multiplied by the appropriate expansion and condition proportion adjustment factor located in the POP_STRATUM or PLOT_PNW table.

26. DSTRBCD1

Disturbance 1 code. A code indicating the kind of disturbance occurring since the last measurement or within the last 5 years for new plots. The area affected by the disturbance must be at least 1 acre in size. A significant level of disturbance (mortality or damage to 25 percent of the trees in the condition) is required. Populated for all forested conditions.

Code	Description
0	No visible 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 damage to trees, including seedlings and saplings
30	Fire damage (from crown and ground fire, either prescribed or natural)
31	Ground fire damage
32	Crown fire damage
40	Animal damage
41	Beaver (includes flooding caused by beaver)
42	Porcupine
43	Deer/ungulate
44	Bear
45	Rabbit
46	Domestic animal/livestock (includes grazing)
50	Weather damage
51	Ice
52	Wind (includes hurricane, tornado)
53	Flooding (weather induced)
54	Drought
55	Earth movement/avalanches
60	Vegetation (suppression, competition, vines)
70	Unknown / not sure / other (include in NOTES)
80	Human-caused damage – any significant threshold of human-caused damage not described in the DISTURBANCE codes or in the TREATMENT codes.

90 Geologic disturbances
- 91 Landslide
- 92 Avalanche track
- 93 Volcanic blast zone
- 94 Other geologic event
- 95 Earth movement/avalanches

27. DSTRBCD2 — Disturbance 2 code. The second disturbance code, if the stand has experienced more than one disturbance. See DSTRBCD1 for more information.

28. DSTRBCD3 — Disturbance 3 code. The third disturbance code, if the stand has experienced more than two disturbances. See DSTRBCD1 for more information.

29. DSTRBYR1 — Disturbance year 1. Year in which Disturbance 1 is estimated to have occurred. If the disturbance occurs continuously over a period of time, the value 9999 is used. Populated for all forested conditions that have some disturbance using the National Field Guide protocols. If DISTRBCD1 = 0 then DSTRBYR1 = blank (null) or 0.

30. DSTRBYR2 — Disturbance year 2. The year in which Disturbance 2 occurred. See DSTRBYR1 for more information.

31. DSTRBYR3 — Disturbance year 3. The year in which Disturbance 3 occurred. See DSTRBYR1 for more information.

32. FLDAGE — Field-recorded stand age. The stand age as assigned by the field crew. Based on the average total age, to the nearest year, of the trees in the field-recorded stand size class of the condition, determined using local procedures. For non-stocked stands, 0 is stored. If all of the trees in a condition class are of a species that by regional standards cannot be bored for age (e.g., oak, tupelo), 998 is recorded.

33. FLDSZCD — Field stand-size class code. Field-assigned classification of the predominant (based on stocking) diameter class of live trees within the condition.

Code	Description
0	**Nonstocked:** Meeting the definition of accessible land and one of the following applies (1) less than 10 % stocked by trees of any size, and not classified as cover trees (see code 6), or (2) for several western woodland species where stocking standards are not available, less than 5 % crown cover of trees of any size
1	**Seedlings / saplings stands:** Trees ≤ 4.9 inches. At least 10 % stocking (or 5 % crown cover if stocking standards are not available) in trees of any size; and at least 2/3 of the crown cover is in trees less than 5.0 inches DBH/DRC
2	**Poletimber sized stands:** 5.0 – 8.9 inches (softwoods)/ 5.0 – 10.9 inches (hardwoods). At least 10 % stocking (or 5 % crown cover if stocking standards are not available) in trees of any size; and at least one-third of the crown cover is in trees greater than 5.0 inches DBH/DRC and the plurality of the crown cover is in softwoods 5.0 – 8.9 inches diameter and/or hardwoods 5.0 –10.9 inches DBH, and/or for western woodland trees 5.0 – 8.9 inches DRC

3 **Small sawtimber sized stands:** 9.0 – 19.9 inches (softwoods)/ 11.0 – 19.9 inches (hardwoods). At least 10 % stocking (or 5 % crown cover if stocking standards are not available) in trees of any size; and at least one-third of the crown cover is in trees greater than 5.0 inches DBH/DRC and the plurality of the crown cover is in softwoods 9.0 – 19.9 inches diameter and/or hardwoods between 11.0 –19.9 inches DBH, and for western woodland trees 9.0 – 19.9 inches DRC

4 **Medium sawtimber sized stands:** 20.0 – 39.9 inches. At least 10 % stocking (or 5 % crown cover if stocking standards are not available) in trees of any size; and at least one-third of the crown cover is in trees greater than 5.0 inches DBH/DRC and the plurality of the crown cover is in trees 20.0 – 39.9 inches DBH

5 **Large sawtimber sized stands:** 40.0+ inches. At least 10 % stocking (or 5 % crown cover if stocking standards are not available) in trees of any size; and at least one-third of the crown cover is in trees greater than 5.0 inches DBH/DRC and the plurality of the crown cover is in trees $\geq$ 40.0 inches DBH

6 **Cover trees on nonforest land:** (trees not on species list, used for plots classified as nonforest): Less than 10 % stocking by trees of any size, and greater than 5 % crown cover of species that comprise cover trees.

34. FLDTYPCD Field forest type code. Forest type, assigned by the field crew, based on the tree species or species groups forming a plurality of all live stocking. The field crew assesses the forest type based on the acre of forestland around the plot, in addition to the species sampled on the condition. Refer to appendix D for a detailed list of forest type codes and names.

Nonstocked forest land is land that currently has less than 10 percent stocking but formerly met the definition of forest land. When PLOT.MANUAL < 2.0, forest conditions that do not meet this stocking level were coded FLDTYPCD = 999. Beginning with manual version 2.0, the crew recorded the previous forest type on remeasured plots or, on all other plots, the most appropriate forest type to the condition based on the seedlings present or the forest type of the adjacent forest stands. Beginning with manual version 2.0, the crew no longer recorded nonstocked as 999. Instead, they recorded FLDSZCD = 0 to identify nonstocked conditions and entered an estimated forest type for the condition. The crew determined the estimated forest type by either recording the previous forest type on remeasured plots or, on all other plots, the most appropriate forest type to the condition based on the seedlings present or the forest type of the adjacent forest stands. In general, when FLDTYPCD is used for analysis, it is necessary to examine the values of both FLDTYPCD and FLDSZCD to identify nonstocked forest land.

35. FORTYPCD — Forest type code. This is the forest type used for reporting purposes. It is primarily derived using a computer algorithm, except when less than 25 percent of the plot samples a forest condition. Use the REF_FORTYPE table as a crosswalk to names.

Usually, FORTYPCD equals FORTYPCDCALC. In certain situations, however, the result from the algorithm (FORTYPCDCALC) is overridden by the field call. The field-recorded forest type code (FLDTYPCD) is stored in this attribute when less than 25 percent of the plot samples the forested condition (CONDPROP_UNADJ < 0.25). Situations of undersampling may cause this attribute to differ from FORTYPCDCALC.

Nonstocked forest land is land that currently has less than 10 percent stocking but formerly met the definition of forest land. Forest conditions meeting this definition have few, if any, trees sampled. In these instances, the algorithm cannot assign a specific forest type and the resulting forest type code is 999, meaning nonstocked.

Refer to appendix D for the complete list of forest type codes and names.

36. FORTYPCDCALC — Forest type code calculated. Forest type is always calculated based on the tree species sampled on the condition. The forest typing algorithm is a hierarchical procedure applied to the tree species sampled on the condition. The algorithm begins by comparing the live tree stocking of softwoods and hardwoods and continues in a stepwise fashion comparing successively smaller subgroups of the preceding aggregation of initial type groups, selecting the group with the largest aggregate stocking value. The comparison proceeds in most cases until a plurality of a forest type is identified.

Nonstocked forest land is land that currently has less than 10 percent stocking but formerly met the definition of forest land. Forest conditions meeting this definition have few, if any, trees sampled. In these instances, the algorithm cannot assign a specific forest type and the resulting forest type code is 999, meaning nonstocked. See also FORTYPCD and FLDTYPCD for other forest type attributes. Refer to appendix D for a complete list of forest type codes and names.

37. GROUND_LAND_CLASS_PNW

Present ground land class. A refinement of forest land that distinguishes timberland and a variety of forest land types. Each code, and corresponding ground land class (GLC) name and description are listed. When using the timberland code, include RESERVCD=0 to identify the traditional unreserved timberland designation.

Code	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/hectare/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.

Code	Description
	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 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 predominant species.
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. Ten percent juniper stocking means 10 percent crown cover at stand maturity. For western woodland juniper species, ten percent stocking means 5 percent crown cover at stand maturity.
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	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 predominant species 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.

Code	Description
149	Other forest- Low Productivity (this code is calculated in the office) - Forestland 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.
150	Other forest curlleaf mountain mahogany - Areas currently capable of 10 percent or more tree stocking with forest trees, with curlleaf mountain mahogany 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 mahogany stocking means 5 percent crown cover at stand maturity.

38. GSSTK — Growing-stock stocking percent. The sum of stocking percent values of all growing stock trees on the condition. The percent is then assigned to a stocking class, which is found in GSSTKCD.

39. GSSTKCD — Growing-stock stocking code. A code indicating the stocking of the condition by growing-stock trees, including seedlings. Growing-stock trees are those where tree class (TREE.TREECLCD) equals 2 or, for seedlings that do not have tree class assigned where species group (TREE.SPGRPCD) is not equal to 23 (woodland softwoods) or 48 (woodland hardwoods). Populated for all forest annual plots.

Code	Description
1	Overstocked (100+ %)
2	Fully stocked (60 – 99%)
3	Medium stocked (35 – 59%)
4	Poorly stocked (10 – 34%)
5	Nonstocked (0 – 9%)

40. HABTYPCD1 — Habitat type code 1. A code indicating the primary habitat type (or community type) for this condition. Unique codes are determined by combining both habitat type code and publication code (HABTYPCD1 and HABTYPCD1_PUB_CD). Habitat type captures information about both the overstory and understory vegetation and usually describes the vegetation that is predicted to become established after all successional stages of the ecosystem are completed without any disturbance. This code can be translated using the publication in which it was named and described (see HABTYPCD1_PUB_CD and HABYTYPCD1_DESCR_PUB_CD).

41. HABTYPCD1_PUB_CD — Habitat type code 1 publication code. A code indicating the publication that lists the name for the habitat type code (HABTYPCD1). Publication information is documented in the REF_HAPTYP_PUBLICATION table.

42. MAPDEN

Mapping density. A code indicating the relative tree density of the condition. Codes other than 1 are used as an indication that a significant difference in tree density is the only factor causing another condition to be recognized and mapped on the plot.

Code	Description
1	Initial tree density class
2	Density class 2 – density different than density of the condition assigned a tree density class of 1
3	Density class 3 – density different than densities of the conditions assigned tree density classes of 1 and 2

43. MIXEDCONFCD

Mixed conifer site code. An indicator that the condition is a mixed conifer site in California. This column is used to select a mixed conifer site index equation for the condition. This is a Yes/No field (Y/N). Only collected in California

44. OWNCD

Owner class code. (O*ptional for nonforest land.*) A code indicating the class in which the landowner (at the time of the inventory) belongs. When PLOT.DESIGNCD = 999, OWNCD may be blank (null).

Code	Description
11	National Forest System (NFS)
12	National Grassland
13	Other Forest Service land
21	National Park Service
22	Bureau of Land Management
23	Fish and Wildlife Service
24	Department of Defense/Energy
25	Other federal land
31	State
32	Local (County, Municipal, etc)
33	Other non-federal public
46	All private landowners

The following detailed private owner land codes that further identify private owners are not available in this database because of the FIA data confidentiality policy. Users needing this type of information should contact the FIA program (kwaddell@fs.fed.us or jdonnegan@fs.fed.us) to discuss specific needs or request summarized data about these owners. Or, contact the FIA Spatial Data Services (SDS) group by following the instructions provided at: http://www.fia.fs.fed.us/tools-data/spatial/.

Code	Description
41	Corporate
42	Non-governmental conservation/natural resources organization
43	Unincorporated local partnership/association/club
44	Native American (Indian)
45	Individual

45. OWNGRPCD Owner group code. (*Core optional for nonforest land*) A broader group of landowner classes. When PLOT.DESIGNCD = 999, OWNGRPCD may be blank (null).

Code	Description	
10	Forest Service	(OWNCD 11, 12, 13)
20	Other federal	(OWNCD 21, 22, 23, 24, 25)
30	State and local government	(OWNCD 31, 32, 33)
40	Private	(OWNCD 41, 42, 43, 44, 45,46)

46. PHYSCLCD Physiographic class code. The general effect of land form, topographical position, and soil on moisture available to trees. These codes are new in annual inventory; older inventories have been updated to these codes when possible

Code	Description
	Xeric sites (normally low or deficient in available moisture)
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, ridges, and flats in the South, sites along the beach and shores of lakes and streams.
19	Other Xeric - All dry physiographic sites not described above.
	Mesic sites (normally moderate but adequate available moisture)
21	Flatwoods - Flat or fairly level sites outside of 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 flood plains.
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 flood plains/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/Bottomlands - Floodplains and bottomlands ¼ mile or wider 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.
	Hydric sites (normally abundant or overabundant moisture all year)
31	Swamps/Bogs - Low, wet, flat, forested areas usually quite extensive that are flooded for long periods 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 sites in the Carolina bays in the Southeast United States.
34	Beaver ponds.
35	Cypress ponds.
39	Other hydric - All other hydric physiographic sites.

47. PLANT_STOCKABILITY_FACTOR_PNW

Plant stockability factor. Some plots in PNWRS have forest land condition classes that are low site, and are incapable of attaining normal yield table levels of stocking. For such classes, potential productivity (MAI at culmination) must be discounted. Most forested conditions have a default value of 1 assigned; those conditions that meet the low site criteria have a value between 0.1 and 1. Key plant indicators and plant communities are used to assign discount factors, using procedures outlined in MacLean and Bolsinger (1974) and Hanson and others (2002).

48. PRESNFCD Present nonforest code. A code indicating the current nonforest land use.

Code	Description
10	Agricultural land
11	Cropland
12	Pasture (improved through cultural practices)
13	Idle farmland
14	Orchard
15	Christmas tree plantation
16	Maintained wildlife opening
17	Windbreak/Shelterbelt
20	Rangeland
30	Developed
31	Cultural (business, residential, other intense human activity)
32	Rights-of-way (improved road, railway, power line)
33	Recreation (park, golf course, ski run)
34	Mining
40	Other (undeveloped beach, marsh, bog, snow, ice)
41	Nonvegetated
42	Wetland
43	Beach
45	Nonforest-Chaparral

49. PROP_BASIS — Proportion basis. A value indicating what type of fixed-size subplots were installed when this plot was sampled. This information is needed in order to use the proper adjustment factor for the stratum in which the plot occurs. Usually, in most of PNW, the 58.9-foot radius macroplots are installed, and the value is "MACR". In Alaska, 24-foot radius subplots are installed and in this case, the value for PROP_BASIS is "SUBP". When summarizing land area, if PROP_BASIS = "MACR" then use POP_STRATUM.ADJ_FACTOR_MACR ; or if PROP_BASIS = "SUBP" then use POP_STRATUM.ADJ_FACTOR_SUBP to adjust the land area estimate to account for partially unsampled plots in the stratum.

Alternatively, use PLOT_PNW.ADJ_FACTOR_EXPCURR for every condition, regardless of the PROP_BASIS value. The correct factor has already been stored in this column, no need to check the PROP_BASIS code. See PLOT_PNW table columns for more information.

50. SIBASE — Site index base age. The base age (sometimes called reference age), in years, of the site index curve used to derive site index. Base age may be breast height age or total age, depending on the specifications of the site index curves being used. This attribute is blank (null) when no site tree data are available.

51. SICOND — Site index for the condition. This represents the average total length in feet that dominant and co-dominant trees are expected to attain in well-stocked, even-aged stands at the specified base age (SIBASE). Site index is estimated for the condition by either using an individual tree or by averaging site index values that have been calculated for individual site trees (see SITETREE.SITREE) of the same species (SISP). As a result, it may be possible to find additional site index values that are not used in the calculation of SICOND in the SITETREE tables when site index has been calculated for more than one species in a condition. This attribute is blank (null) when no site index data are available.

52. SISP — Site index species code. The species upon which the site index is based. In most cases, the site index species will be one of the species that define the forest type of the condition (FORTYPCD). In cases where there are no suitable site trees of the type species, other suitable species may be used. This attribute is blank (null) when no site tree data are available.

53. SITECLCDEST — Site productivity class code estimated. This is a field-recorded code that is an estimated or predicted indicator of site productivity. It is used as the value for SITECLCD if no valid site tree is available. When SITECLCDEST is used as SITECLCD, SITECL_METHOD is set to 6.

Code	Description
1	225+ cubic feet/acre/year
2	165-224 cubic feet/acre/year
3	120-164 cubic feet/acre/year
4	85-119 cubic feet/acre/year
5	50-84 cubic feet/acre/year
6	20-49 cubic feet/acre/year
7	0-19 cubic feet/acre/year

54. SITECL_METHOD Site class method. A code identifying the method for determining site index or estimated site productivity class.

Code	Description
1	Tree measurement (length, age, etc.) collected during this inventory.
2	Tree measurement (length, age, etc.) collected during a prev. inventory.
3	Site index or site productivity class estimated either in the field or office.
4	Site index or site productivity class estimated by the height intercept method during this inventory.
5	Site index or site productivity class estimated using multiple site trees.
6	Site index or site productivity class estimated or assigned in the office.

55. SLOPE Slope. The angle of slope, in percent, of the condition. Valid values are 000 through 155 . Slope is collected on subplots and then assigned to a condition. The slope from the subplot with the greatest percentage of the current condition is assigned to that condition. In the event that two or more subplots represent the same amount of area in the condition, the slope from the lower numbered subplot is used. Populated for all forest annual plots.

56. SOIL_ROOTING_DEPTH_PNW
Soil rooting depth. Describes the soil depth (the depth tree roots can penetrate to) within each forest land condition class. Required for all forest condition classes. This variable is coded 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. Only collected by PNW.

Code	Description
1	< 20 inches
2	> 20 inches

57. STDAGE Stand age. Stand age is equal to the field-recorded stand age (FLDAGE) with some exceptions. When FLDAGE = 998 no trees were cored in the field. For these conditions, stand age has been set to 9999 (unknown) to facilitate the use of crosswalk tables in queries and reports. For all inventories, **nonstocked stands** (**FORTYPCD=999**) have **STDAGE set to 0** and **STDSIZCD = 5.** Age is difficult to measure and therefore STDAGE may have large measurement errors.
Link to the zPNWREF_STAND_AGE_CLASSES crosswalk table to translate codes.

58. STDSZCD Stand-size class code. A classification of the predominant (based on stocking) diameter class of live trees within the condition assigned using an algorithm. Large diameter trees are >= 11.0 inches diameter for hardwoods and >= 9.0 inches diameter for softwoods. Medium diameter trees are >= 5.0 inches diameter and smaller than large diameter trees. Small diameter trees are < 5.0 inches diameter. When less than 25 % of the plot samples the forested condition (CONDPROP_UNADJ < 0.25), this attribute is set to the equivalent field-recorded stand size class (FLDSZCD). Populated for all forested conditions.
Link to the zPNWREF_STANDSIZE crosswalk table to translate codes.

Code	Description
1	**Large diameter**: Stands with an all live stocking of at least 10; with more than 50 % of the stocking in medium and large diameter trees; and with the stocking of large diameter trees equal to or greater than the stocking of medium diameter trees
2	**Medium diameter**: Stands with an all live stocking of at least 10; with more than 50 % of the stocking in medium and large diameter trees; and with the stocking of large diameter trees less than the stocking of medium diameter trees
3	**Small diameter**: Stands with an all live stocking value of at least 10 on which at least 50 % of the stocking is in small diameter trees
5	**Nonstocked**: Forest land with all live stocking < 10%.

59. STDORGCD — Stand origin code. Method of stand regeneration for the trees in the condition. An artificially regenerated stand is established by planting seedlings or artificial seeding. Populated for all forested conditions.

Code	Description
0	Natural stands
1	Clear evidence of artificial regeneration

60. STDORGSP — Stand origin species code. The species code for the predominant artificially regenerated species (only when STDORGCD = 1). See appendix F.

61. STND_COND_CD_PNWRS

Stand condition code, Pacific Northwest Research Station. A code that best describes the condition of the stand within forest condition classes. Stand condition is defined here as " the size, density, and species composition of a plant community following disturbance and at various time intervals after disturbance." Information on stand condition is used in describing wildlife habitat. Only collected in CA, OR, and WA. This column was only collected on the first measurement of the plot.

Code	Stand Condition	Definition
0	Not applicable	Condition class is juniper, chaparral, or curlleaf mountain mahogany forest type.
1	Grass-forb	Shrubs less than 40% crown cover and less than 5 feet tall; plot may range from being largely devoid of vegetation to dominance by herbaceous species (grasses and forbs); tree regeneration generally less than 5 feet tall and 40% cover.

2	Shrub	Shrubs 40% crown canopy or greater, of any height; trees less than 40% crown canopy and less than 1.0 inches DBH/DRC. When average stand diameter exceeds 1.0 inches DBH/DRC, plot is “open sapling” or “closed sapling.”
3	Open sapling-poletimber	Average stand diameter 1.0-8.9 inches DBH/DRC, and tree crown canopy poletimber is less than 60%.
4	Closed sapling, pole, sawtimber	Average stand diameter is 1.0-21.0 inches DBH/DRC and crown cover is 60% or greater.
5	Open sawtimber	Average stand diameter is 9.0-21.0 inches DBH/DRC, and crown cover is less than 60%.
6	Large sawtimber	Average stand diameter exceeds 21.0 inches DBH/DRC; crown cover may be less than 100%; decay and decadence required for old-growth characteristics is generally lacking, successional trees required by old-growth may be lacking, and dead and down material required by old-growth is lacking.
7	Old-growth	Average stand diameter exceeds 21.0 inches DBH/DRC. Stands over 200 years old with at least two tree layers (overstory and understory), decay in living trees, snags, and down woody material. Some of the overstory layer may be composed of long-lived successional species (i.e., Douglas-fir, western redcedar).

62. STND_STRUC_CD_PNWRS

Stand structure code, PNWRS. A code indicating the best overall structure of the stand. Only collected in CA, OR, and WA. This column was only collected on the first measurement of the plot.

Code	**Stand Structure**	**Definition**
1	Even-aged single-storied	A single even canopy characterizes the stand. The greatest numbers 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 trees usually do not differ by more than 20 years.

Code	Stand Structure	Definition
2	Even-aged two-storied	Stands composed of two distinct canopy layers, such as, an overstory with an understory sapling layer possibly from seed tree and shelterwood operations. This may also be true in older plantations, where shade-tolerant trees may 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 is 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. Logging disturbances (examples are 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 stand. The aggregations may or may not be even-aged.

63. STUMP_CD_PNWRS

Stump code, Pacific Northwest Research Station. A yes/no attribute indicating whether or not stumps are present on a condition. Only collected in CA, OR, and WA.

Code	Description
Y	Yes, evidence of cutting or management exists
N	No evidence of cutting exists

64. TRTCD1 Treatment code 1. Forestry treatments are a form of disturbance. These human 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. Record up to three different treatments per condition class from most important to least important as best as can be determined. Null is erroneous for this variable. Code 00 if no disturbance is observed. Populated for all forested conditions. See TRTCD1_PNWRS in the COND_PNW table for more detailed codes collected only by PNW.

TRTCD	Brief description	Detailed description
00	None	No observable treatment.
10	Cutting	The removal of one or more trees from a stand.
20	Site preparation	Clearing, slash burning, chopping, disking, bedding, or other practices clearly intended to prepare a site for either natural or artificial regeneration.
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.
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.
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.

65. TRTCD2 Treatment code 2. A code indicating the type of stand treatment that has occurred since the last measurement or within the last 5 years for new plots. Up to three different treatments can be recorded per condition class, from most important to least important as best as can be determined.

66. TRTCD3 Treatment code 3. A code indicating the type of stand treatment that has occurred since the last measurement or within the last 5 years for new plots. Up to three different treatments can be recorded per condition class, from most important to least important as best as can be determined.

67. TRTYR1 Treatment year 1. Year in which Stand Treatment 1 is estimated to have occurred. Populated for all forested conditions that have some treatment recorded. If TRTCD1 = 00 then TRTYR1 = blank (null) or 0.

68. TRTYR2 Treatment year 2. Year in which Stand Treatment 2 is estimated to have occurred. Populated for all forested conditions that have some TRTCD2 recorded. If TRTCD2 = 00 then TRTYR2 = blank (null) or 0.

69. TRTYR3 Treatment year 3. Year in which Stand Treatment 3 is estimated to have occurred. Populated for all forested conditions that have some TRTCD3 recorded. If TRTCD3 = 00 then TRTYR3 = blank (null) or 0.

70. VOL_LOC_GRP Volume location group. An identifier indicating what equations are used for volume, biomass, site index, etc. A volume group is usually designated for a geographic area, such as a State, multiple States, a group of counties, or an ecoregion.

Code	Description
S26LCA	California other than mixed conifer forest type
S26LCAMIX	California mixed conifer forest type
S26LEOR	Eastern Oregon
S26LWOR	Western Oregon
S26LORJJ	Oregon Jackson and Josephine Counties
S26LEWA	Eastern Washington
S26LWWA	Western Washington
S26LWACF	Washington Silver Fir Zone

71. CANOPY_CVR_SAMPLE_METHOD_CD
Canopy cover sample method code. A code indicating the canopy cover sample method used to determine LIVE_CANOPY_CVR_PCT, LIVE_MISSING_CANOPY_CVR_PCT, and NBR_LIVE_STEMS.

Code	Description	Code	Description
1	Ocular method	3	Acre method
2	Subplot method	4	Sub-acre method

72. LIVE_CANOPY_CVR_PCT
Live canopy cover percent. The percentage of live canopy cover for the condition. Included are live tally trees, saplings, and seedlings that cover the sample area.

73. LIVE_MISSING_CANOPY_CVR_PCT
Live plus missing canopy cover percent. This percentage for the condition is determined in the field by adding LIVE_CANOPY_CVR_PCT plus the estimated missing canopy cover that existed prior to disturbance (harvesting, fire, chaining, etc.) Included are live and dead and removed tally trees, saplings, and seedlings. Dead trees and dead portions of live trees are not considered as missing unless it is part of the condition disturbance. The estimate is based on field observations, aerial photos, historical aerial imagery, and similar evidence of undisturbed conditions. The total of LIVE_MISSING_CANOPY_CVR_PCT cannot exceed 100 percent.

74. NBR_LIVE_STEMS Number of live stems. The estimated number of live stems per acre of the condition. The estimate in the field is based on actual stem count of tally tree species within the sample area

75. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is

obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

76. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

COND_PNW table (Condition Table with PNW regional attributes)

Contains data that were collected only by the PNW FIA work unit. Includes new columns that help simplify creating and running queries from the database.

	Column Name	Descriptive Name	Data Type
1	CND_CN (primary key)	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	STATECD	State code	Integer
5	PLOT	Phase 2 plot number	Integer
6	CONDID	Condition identifier	Integer
7	CONDPROP_ADJ	Adjusted condition proportion	Real
8	CONDPROP_ADJ_2010	Adjusted condition proportion for 2001-2010 or 2002-2011 only	Real
9	FORESTLAND_YN	Forest land condition	Text
10	TIMBERLAND_YN	Timberland condition	Text
11	EST_NON_SAMP_LCT_PNWRS	Estimated land cover type	Integer
12	FIRE_CD_PNWRS	Fire evidence on condition	Integer
13	LAND_STATUS_CD	Land , water, and reserve status	Integer
14	LAND_STATUS_TEXT	Definition of each land status code	Text
15	LAND_STATUS_OWNER_CD	Owner, land , water, and reserve status	Integer
16	MAI	Mean annual increment	Integer
17	QMD_ALL_LIVETREES	Quadratic mean diameter, Live trees	Real
18	QMD_SOFTWOODS	Quadratic mean diameter, softwoods	Real
19	QMD_HARDWOODS	Quadratic mean diameter, hardwoods	Real
20	RESERVED_AREA_NAME	Name of reserved area	Text
21	STAND_DENSITY_INDEX	Stand density index	Integer
22	TRTCD1_PNWRS	Detailed stand treatment codes	Integer
23	TRTCD2_PNWRS	Detailed stand treatment codes	Integer
24	TRTCD3_PNWRS	Detailed stand treatment codes	Integer
25	TRTYR1_PNWRS	Year of treatment	Integer
26	TRTYR2_PNWRS	Year of treatment	Integer
27	TRTYR3_PNWRS	Year of treatment	Integer
28	HIST_DSTRBCD1_PNWRS	Historical disturbance code	Integer
29	HIST_DSTRBCD2_PNWRS	Historical disturbance code	Integer
30	HIST_DSTRBCD3_PNWRS	Historical disturbance code	Integer
31	HIST_DSTRBYR1_PNWRS	Year of Historical disturbance	Integer
32	HIST_DSTRBYR2_PNWRS	Year of Historical disturbance	Integer
33	HIST_DSTRBYR3_PNWRS	Year of Historical disturbance	Integer

	Column Name	Descriptive Name	Data Type
34	HIST_TRTCD1_PNWRS	Historical stand treatment code	Integer
35	HIST_TRTCD2_PNWRS	Historical stand treatment code	Integer
36	HIST_TRTCD3_PNWRS	Historical stand treatment code	Integer
37	HIST_TRTYR1_PNWRS	Year of Historical treatment	Integer
38	HIST_TRTYR2_PNWRS	Year of Historical treatment	Integer
39	HIST_TRTYR3_PNWRS	Year of Historical treatment	Integer

1. CND_CN — Sequence number. A unique number used to identify a condition record. Here, it is a foreign key linking the records in this table to the records in the COND table or any other table that contains CND_CN. The CND_CN column is found in many FIADB tables, and is usually one of the key columns you will use to link to other tables. In the COND table, the column name is simply CN. Note that CND_CN is not the condition class number.

2. PLT_CN — Plot sequence number. Foreign key linking the COND_PNW record to the plot record. A unique number that identifies every record in the PLOT table. It is also a foreign key linking the records in this table to the plot record in any other table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number.

3. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

4. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

5. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

6. CONDID — Condition class number.

7. CONDPROP_ADJ — Adjusted condition proportion. The adjusted proportion of the plot that is in the condition. When generating population area estimates, this proportion is multiplied by PLOT_PNW.EXPCURR to produce summaries in acres, for current estimates using the most recent 10 years of data. This column is calculated from CONDPROP_UNADJ*ADJ_FACTOR _EXPCURR.

8. CONDPROP_ADJ_2010

Adjusted condition proportion for 2001-2010(CAOR) or 2002-2011(WA). The adjusted proportion of the plot that is in the condition. When generating population area estimates for plots from the DWM inventory, this proportion is multiplied by PLOT_PNW_2010.EXPCURR to produce summaries in acres, for current estimates using the first 10 years of data for each state. This column is calculated from CONDPROP_UNADJ*ADJ_FACTOR_EXPCURR in the PLOT_PNW_2010 table. Using this column simplifies queries created from the database.

9. FORESTLAND_YN Identifies conditions that are forest land for easy selection of these records. Forest land is identified by: COND_STATUS_CD =1.

Y	The condition is forest land
N	The condition class is not forest land

10. TIMBERLAND_YN Identifies conditions that are timberland for easy selection of these records. Timberland is identified by: COND_STATUS_CD =1 and SITECLCD <7 and RESERVCD=0.

Y	The condition is timberland
N	The condition class is not timberland

11. EST_NON_SAMP_LCT_PNWRS

Land cover type on nonsampled lands, estimated. The land cover type that best represents the condition class, as determined from the air, ground, or some form of remote sensing. A crews best judgment is used when estimating which cover type is present. Based on the plurality of the cover type present for the entire condition class. Recorded when CONDITION_NONSAMPLED_REASON = 2, 3, or 10.

Code	Cover type
1	Forest land
2	Nonforest land
3	Noncensus water
4	Census water

12. FIRE_CD_PNWRS Identifies condition classes that have evidence of a past or present fire occurrence.

Y	The condition class has evidence of a past or present fire occurrence
N	The condition class has no evidence of fire occurrence

13. LAND_STATUS_CD A code that identifies the land status and reserved status of a condition. This column is very useful for grouping in queries and reports. It identifies whether the land is timberland, unreserved 'other forest' land, reserved productive, reserved 'other forest', nonforest land, water, nonsampled-access denied, or nonsampled-hazardous. This column along with LAND_STATUS_TEXT should be used to group and label summary queries and reports.

CODE	LAND_STATUS_TEXT
1	1_Unreserved_Timberland
2	2_Unreserved_Other_forest
3	3_Reserved_Productive
4	4_Reserved_Other_forest

5	5_Nonforest land
6	6_Water_Noncensus
7	7_Water_Census
8	8_Nonsampled_Access denied
9	9_Nonsampled_Hazardous
10	10_Nonsampled_Other

14. LAND_STATUS_TEXT

The description of each land status code, see LAND_STATUS_CD above.

15. LAND_STATUS_OWNER_CD

A code that identifies the land status, reserved status, and owner of a condition. This column is very useful for grouping in queries and reports. To crosswalk to the text for this code, link to the zPNWREF_ForestLandStatus_by_owner_brief reference table.

LAND_STATUS_OWNER_CD	LAND_STATUS_OWNER_CD_text
1	1_NFS_Timberland
2	2_NFS_Other_Forest
3	3_OtherFed_Timberland
4	4_OtherFed_Other_Forest
5	5_StateLoc_Timberland
6	6_StateLoc_Other_Forest
7	7_Priv_Timberland
8	8_Priv_Other_Forest

16. MAI

The mean annual increment (MAI) or mean annual growth refers to the average growth per year a tree or stand of trees has exhibited/experienced to a specified age. The typical growth pattern of most trees is sigmoidal, so the MAI starts out small, increases to a maximum value as the tree matures, then declines slowly over the remainder of the tree's life. Throughout this, the MAI always remains positive. MAI differs from periodic annual increment (PAI) because the PAI is simply the growth for any specified length of time. The point where the MAI and PAI meet is typically referred to as the biological rotation age. This is the age at which the tree or stand would be harvested if the management objective is to maximize long-term yield.

17. QMD_ALL_LIVETREES

The quadratic mean diameter or QMD is a measure of central tendency which is considered more appropriate than the arithmetic mean for characterizing trees in a forest stand. Compared to the arithmetic mean, QMD assigns greater weight to larger trees and is always greater than or equal to arithmetic mean for a given set of trees. QMD can be used in timber cruises to estimate the standing volume of timber in a forest, because it has the practical advantage of being directly related to Basal area, which in turn is directly related to volume.

18. QMD_SOFTWOODS

The quadratic mean diameter or QMD for the softwoods in the stand, is a measure of central tendency which is considered more appropriate than the arithmetic mean

for characterizing trees in a forest stand. Compared to the arithmetic mean, QMD assigns greater weight to larger trees and is always greater than or equal to arithmetic mean for a given set of trees. QMD can be used in timber cruises to estimate the standing volume of timber in a forest, because it has the practical advantage of being directly related to Basal area, which in turn is directly related to volume.

19. QMD_HARDWOODS

The quadratic mean diameter or QMD for the hardwoods in the stand, is a measure of central tendency which is considered more appropriate than the arithmetic mean for characterizing trees in a forest stand. Compared to the arithmetic mean, QMD assigns greater weight to larger trees and is always greater than or equal to arithmetic mean for a given set of trees. QMD can be used in timber cruises to estimate the standing volume of timber in a forest, because it has the practical advantage of being directly related to Basal area, which in turn is directly related to volume.

20. RESERVED_AREA_NAME

If the reserved status of a condition is reserved (COND.RESERVCD=1) then the name associated with this land area is recorded here. Add this column to queries or reports when summarizing attributes about reserved forest land.

21. STAND_DENSITY_INDEX

Stand density index (also known as Reineke's Stand Density Index) is a measure of the stocking of a stand of trees based on the number of trees per unit area and diameter at breast height of the tree of average basal area. It may also be defined as the degree of crowding within stocked areas, using various growing space ratios based on crown length or diameter, tree height or diameter, and spacing. Stand density index is usually well correlated with stand volume and growth, and several variable-density yield tables have been created using it.

22. TRTCD1_PNWRS Treatment code 1, combination of national and regional codes.

Forestry treatments are a form of human disturbance. 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. Up to three different treatments can be recorded per condition class from most important to least important as best as can be determined. Null is erroneous for this variable. Code 00 if no disturbance is observed. Populated for all forested conditions. Not collected in Alaska.
This column includes more detailed information than COND.TRTCD1

TRTCD	Brief description	Detailed description
00	None	No observable treatment.
10	Cutting	The removal of one or more trees from a stand.
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.
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

TRTCD	Brief description	Detailed description
		harvest.
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.
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 ownership of origin, for improvements such as buildings, bridges and fences. This code does not require a 1.0-acre minimum size.
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.
16	Precommercial thin	An intermediate harvest in which excess growing stock are cut but not removed.
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.
20	Site preparation	Clearing, slash burning, chopping, disking, bedding, or other practices clearly intended to prepare a site for either natural or artificial regeneration.
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.
31	Planting throughout the stand	Planting the area to establish a manageable stand.
32	Planting within nonstocked holes in the stand	Planting of nonstocked openings to fill-in or create a manageable stand
33	Underplanting	Planting under a sawtimber overstory.
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.
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.
51	Stand conversion	Killing of low-value or unmarketable treesoften hardwoods- and planting of the area to establish a manageable stand. Most commonly, low-value hardwood stands are converted

TRTCD	Brief description	Detailed description
		to conifer stands.
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.
60	Chaining	Removal or killing of undesired woody species, not a silvicultural treatment.

23. TRTCD2_PNWRS Treatment code 2, combination of national and regional codes. Up to three different treatments can be recorded per condition class from most important to least important as best as can be determined. This column includes more detailed information than COND.TRTCD2.

24. TRTCD3_PNWRS Treatment code 3, combination of national and regional codes. Up to three different treatments can be recorded per condition class from most important to least important as best as can be determined. This column includes more detailed information than COND.TRTCD3.

25. TRTYR1_PNWRS The year the first stand treatment occurred. If TRTCD1_PNWRS >0 then TRTYR1_PNWRS should be >0.

26. TRTYR2_ PNWRS The year the second stand treatment occurred

27. TRTYR3_PNWRS The year the third stand treatment occurred.

28. HIST_DSTRBCD1_PNWRS
Historical Disturbance code for disturbances before the Annual inventory field visit, or before the past 5 years if the plot is measured for the first time. Previous plot write-ups and records were used as guides to code the important historical disturbances affecting the current stand (including those which originated the stand). Codes are the same as COND.DSTRBCD1.

29. HIST_DSTRBCD2_PNWRS
Historical Disturbance 2 code. The second disturbance code, if the stand has experienced more than one historical disturbance. Use the same procedures and codes used for Historical Disturbance 1. Codes are the same as COND.DSTRBCD1.

30. HIST_DSTRBCD3_PNWRS
Historical Disturbance 3 code. The third disturbance code, if the stand has experienced more than two historical disturbance. Use the same procedures and codes used for Historical Disturbance 1. Codes are the same as COND.DSTRBCD1.

31. HIST_DSTRBYR1_PNWRS The year the first historical disturbance occurred

32. HIST_DSTRBYR2_PNWRS The year the second historical disturbance occurred

33. HIST_DSTRBYR3_PNWRS The year the third historical disturbance occurred

34. HIST_ TRTCD1_PNWRS
Historical treatment code. Treatment that occurred before the previous field visit, or before the past 5 years if the plot is measured for the first time. If the plot has

been measured at the previous field visit cycle, use previous plot write-ups and records as guides to code the most important historical treatments affecting the current stand (including those which originated the stand).

35. HIST_ TRTCD2_PNWRS
    Historical treatment 2 code. The second treatment, if the stand has experienced more than one historical treatment. Use the same procedures and codes used for Historical Treatment 1.

36. HIST_ TRTCD3_PNWRS
    Historical treatment 3 code. The third treatment, if the stand has experienced more than two historical treatments. Use the same procedures and codes used for Historical Treatment 1.

37. HIST_ TRTYR1_PNWRS The year the first stand treatment occurred

38. HIST_ TRTYR2_PNWRS The year the second stand treatment occurred

49. HIST_ TRTYR3_PNWRS The year the third stand treatment occurred

COUNTY table (A crosswalk table of County codes to names)

	Column name	Descriptive name	data type
1	CN (Primary key)	Sequence number	Text
2	STATECD	State code	Integer
3	UNITCD	Survey unit code	Integer
4	COUNTYCD	County code	Integer
5	COUNTYNM	County name	Text

1. CN — Sequence number. A unique number used to identify a county record.

2. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

3. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State.

STATECD	UNITCD	Survey unit name
6	1	North Coast
6	2	North Interior
6	3	Sacramento
6	4	Central Coast
6	5	San Joaquin
6	6	Southern
41	0	Northwest
41	1	West Central
41	2	Southwest
41	3	Central
41	4	Blue Mountains
53	5	Puget Sound
53	6	Olympic Peninsula
53	7	Southwest
53	8	Central
53	9	Inland Empire

4. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C for codes.

5. COUNTYNM — County name. County name as recorded by the Bureau of the Census for individual counties, or the name given to a similar governmental unit by the FIA program. This table can be linked to many other database tables using CTY_CN or STATECD and COUNTYCD to output the county name in queries or reports.

SUBPLOT table (Data from each of 4 subplots on the plot)

	Column Name	Descriptive Name	Data Type
1	CN (Primary key)	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	STATECD	State code	Integer
5	UNITCD	Survey unit code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	SUBP_STATUS_CD	Subplot/macroplot status code	Integer
10	POINT_NONSAMPLE_REASN_CD	Point nonsampled reason code	Integer
11	P2VEG_SUBP_STATUS_CD	Sampling status for vegetation	Integer
12	P2VEG_SUBP_NONSAMPLE_REASN_CD	Reason for not sampling vegetation	Integer
13	CONDLIST	Subplot/macroplot condition list	Integer
14	MACRCOND	Macroplot center condition	Integer
15	SUBPCOND	Subplot center condition	Integer
16	MICRCOND	Microplot center condition	Integer
17	ASPECT	Subplot aspect	Integer
18	SLOPE	Subplot slope	Integer
19	ROOT_DIS_SEV_CD_PNWRS	Root disease severity rating code, PNW	Integer
20	WATERDEP	Snow/water depth	Integer
21	CYCLE	Inventory cycle number	Integer
22	SUBCYCLE	Inventory subcycle number	Integer

1. CN — Sequence number. A unique number used to identify a subplot record. This appears as SBP_CN in other tables.

2. PLT_CN — Plot sequence number. Foreign key linking the subplot record to the plot record in any other table. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number.

3. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

4. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

5. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

7. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

8. SUBP — Subplot number. The number assigned to the subplot. (1 through 4).

9. SUBP_STATUS_CD — Subplot/macroplot status code. A code indicating whether forest land was sampled on the subplot/macroplot or not.

Code	Description
1	Sampled – at least one accessible forest land condition present on subplot
2	Sampled – no accessible forest land condition present on subplot
3	Nonsampled

10. POINT_NONSAMPLE_REASN_CD
Point nonsampled reason code. For entire subplots (or macroplots) that cannot be sampled, one of the following reasons is recorded.

Code	Description
01	Outside U.S. boundary – Entire subplot (or macroplot) is outside of the U.S. border.
02	Denied access area – Access to the entire subplot (or macroplot) is denied by the legal owner, or by the owner of the only reasonable route to the subplot (or macroplot).
03	Hazardous situation – Entire subplot (or macroplot) cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc.
04	Time limitation – Entire subplot (or macroplot) 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 (e.g., scheduled helicopter rendezvous).
10	Other – Entire subplot (or macroplot) not sampled due to a reason other than one of the specific reasons already listed.
11	Ocean – Subplot falls in ocean water below mean high tide line.

11. P2VEG_SUBP_STATUS_CD

Phase2 vegetation subplot status code. A code indicating if the subplot was sampled for Phase2 vegetation.

12. P2VEG_SUBP_NONSAMPLE_REASN_CD
Phase2 vegetation subplot nonsampled reason code. A code indicating why vegetation on a subplot could not be sampled.

13. CONDLIST — Subplot/macroplot condition list. (*Core optional*.) This is a listing of all condition classes located within the 24.0/58.9 ft radius around the subplot/macroplot center. A maximum of four conditions is permitted on any individual subplot/macroplot. For example: 2300 means these conditions (conditions 2 and 3) are on the subplot/macroplot.

14. MACRCOND — Macroplot center condition. Condition number for the condition at the center of the macroplot. Blank (null) if macroplot is not measured.

15. SUBPCOND — Subplot center condition. Number for the condition at the center of the subplot.

16. MICRCOND — Microplot center condition. Number for the condition at the center of the microplot.

17. ASPECT — Subplot aspect. The direction of slope, to the nearest degree, of the subplot, determined along the direction of slope. If the aspect changes gradually, an average aspect is recorded. If the aspect changes across the subplot but is predominately of one direction, the predominant aspect is recorded. North is recorded as 360. When slope is less than 5 percent, there is no aspect and it is recorded as 000.

18. SLOPE — Subplot slope. The angle of slope, in percent, of the subplot, determined by sighting along the average incline or decline of the subplot. If the slope changes gradually, an average slope is recorded. If the slope changes across the subplot but is predominately of one direction, the predominant slope is recorded. Valid values are 0 through 155.

19. ROOT_DIS_SEV_CD_PNWRS
Root disease severity rating code, Pacific Northwest Research Station. The root disease severity rating that describes the degree of root disease present.

Code	Description
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%; usually as a result of death of 1 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%; up to 30% 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 30-50% 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 50-75% 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% canopy reduction. Macroplots that reach 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.

20. WATERDEP Snow/water depth. The approximate depth in feet of water or snow covering the subplot. Populated for all forested subplots.

21. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

22. SUBCYCLE Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

SUBPLOT_PNW table (Contains regional PNW data)

	Column Name	Descriptive Name	Data Type
1	SBP_CN	Subplot Sequence number	Text
2	STATECD	State code	Integer
3	BURN_ASSESS_CD_PNWRS	Burn assessment	Integer
4	MECH_ASSESS_CD_PNWRS	Mechanical Management Assessment	Integer
5	WATERCD_PNWRS	Water on macroplot	Integer
6	WATER_PROX_CD_PNWRS	Water Proximity	Integer

1. SBP_CN Sequence number. A unique number used to identify a subplot record.

2. STATECD State code.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

3. BURN_ASSESS_CD_PNWRS
   A code indicating the percentage of the 24.0 foot subplot that shows evidence of having been burned since the previous inventory. Plots visited for the first time are evaluated for evidence of a burn within the past 5 years.

   0 No evidence of fire
   1 1 to 50% of subplot burned
   2 51 to 100% of subplot burned

4. MECH_ASSESS_CD_PNWRS
   A code indicating the percentage of the 24.0 foot subplot that shows evidence of having been affected by mechanical manipulation such as tractor use, shear, bulldozer, etc. since previous inventory or within the last 5 years on new plots.

   0 No evidence of mechanical manipulation
   1 1 to 50% of subplot affected (coded only when macroplots are taken)
   2 51 to 100% of subplot affected

5. WATERCD_PNWRS The water source that has the greatest impact on the area within the accessible forestland portion of any of the four (58.9 foot) macroplots. The coding hierarchy is listed in order from large permanent water to temporary water. This variable may be used for recreation, wildlife, hydrology, and timber availability studies. If no water evidence occurs on the 58.9 foot macroplot, then record the code for any water source that occurs within 215 horizontal feet of subplot center. An individual water source may be recorded on two or more subplots.

6. WATER_PROX_CD_PNWRS
   The horizontal distance, in feet, from the edge of the water to the subplot center.

SUBP_COND table (Subplot Condition Table – contains data collected within each condition on the subplot)

	Column name	Descriptive name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CONDID	Condition class number	Integer
4	INVYR	Inventory year	Integer
5	STATECD	State code	Integer
6	UNITCD	Survey unit code	Integer
7	COUNTYCD	County code	Integer
8	PLOT	Phase 2 plot number	Integer
9	SUBP	Subplot number	Integer
10	MACRCOND_PROP	Macroplot-condition proportion	Real
11	SUBPCOND_PROP	Subplot-condition proportion	Real
12	MICRCOND_PROP	Microplot-condition proportion	Real
13	NONFR_INCL_PCT_SUBP	Nonforest inclusions percentage of subplot	Integer
14	NONFR_INCL_PCT_MACRO	Nonforest inclusions percentage of macroplot	Integer
15	CYCLE	Inventory cycle number	Integer
16	SUBCYCLE	Inventory subcycle number	Integer

1. CN — Sequence number. A unique number used to identify a subplot condition record.

2. PLT_CN — Plot sequence number. Foreign key linking the subplot condition record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Link SUBP_COND to the COND table with PLT_CN and CONDID; and SUBP_COND to the SUBPLOT table with PLT_CN and SUBP.

3. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

4. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

5. STATECD State code

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

6. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

7. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

8. PLOT Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

9. SUBP Subplot number. The number assigned to the subplot. The national plot design has subplot number values of 1 through 4.

10. MACRCOND_PROP Macroplot-condition proportion. Proportion of this macroplot in this condition.

11. SUBPCOND_PROP Subplot-condition proportion. Proportion of this subplot in this condition.

12. MICRCOND_PROP Microplot-condition proportion. Proportion of this microplot in this condition.

13. NONFR_INCL_PCT_SUBP
Nonforest inclusion percentage of subplot. Non-forest area estimate, expressed as a percentage, of the 24.0-foot, fixed-radius subplot present within a mapped, accessible forestland condition class in Oregon, Washington, and California.

14. NONFR_INCL_PCT_MACRO
Nonforest inclusion percentage of macroplot. Non-forest area estimate, expressed as a percentage, of the 58.9-foot, fixed-radius macroplot present within a mapped, accessible forestland condition class in Oregon, Washington, and California.

15. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

16. SUBCYCLE Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

SUBP_COND_ROOT_DIS_PNW table (Root disease table for conditions on the subplot)

	Column name	Descriptive name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	STATECD	State code	Integer
4	COUNTYCD	County code	Integer
5	PLOT	Phase 2 plot number	Integer
6	SUBP	Subplot number	Integer
7	CONDID	Condition class number	Integer
8	ROOT_DIS_CD	Type of root disease	Text
9	ROOT_DIS_PCT	Percent of root disease on subplot	Integer

1. CN — Sequence number. A unique sequence number used to identify a subplot condition root disease record.

2. PLT_CN — Plot sequence number. Foreign key linking the subplot condition record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number.

3. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

4. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

5. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

6. SUBP — Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD=1) has subplot number values of 1 through 4. Other plot designs have various subplot number values.

7. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

8. ROOT_DIS_CD — Root disease code. The 2-character text code for the root disease that was observed on the subplot. It is only recorded if the disease is a primary cause of tree death. Secondary infections are not recorded. Refer to the subplot chapter in the field manual for a thorough explanation.

Code	Causal fungus	Disease
PW	Phellinus weirii	laminated root disease
CW	Ceratocystis wagneri	black stain root disease (do not map)
FA	Fomes annosus	annosus root disease
AM	Armillaria ostoyae(mellea)	armillaria (shoestring) root disease
UK	Unknown	
NO	None present	

9. ROOT_DIS_PCT — Root disease percent. The percent (by condition) of the macroplot area that contains the recorded root disease.

TREE table (Contains measured and calculated data for sampled live and dead trees)

	Column Name	Descriptive Name	Data Type
1	CN (Primary key)	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CONDID	Condition class number	Integer
4	INVYR	Inventory year	Integer
5	STATECD	State code	Integer
6	UNITCD	Survey unit code	Integer
7	COUNTYCD	County code	Integer
8	PLOT	Phase 2 plot number	Integer
9	SUBP	Subplot number	Integer
10	TREE	Tree record number	Integer
11	SPCD	Species code	Integer
12	SPGRPCD	Species group code	Integer
13	STATUSCD	Status code	Integer
14	TREECLCD	Tree class code	Integer
15	TPA_UNADJ	Trees per acre unadjusted	Real
16	DIA	Current diameter	Real
17	HT	Total height	Integer
18	ACTUALHT	Actual height	Integer
19	AZIMUTH	Azimuth	Integer
20	BHAGE	Breast height age	Integer
21	BORED_CD_PNWRS	Tree bored code, PNWRS	Integer
22	CARBON_AG	Carbon in the aboveground part of tree (CRM)	Real
23	CARBON_BG	Carbon in the belowground part of tree (CRM)	Real
24	CCLCD	Crown class code	Integer
25	CR	Compacted crown ratio	Integer
26	CULL	Rotten and missing cull	Integer
27	CULL_FLD	Rotten/missing cull	Integer
28	DECAYCD	Decay class code	Integer
29	DIACHECK	Diameter check code	Integer
30	DIACHECK_PNWRS	Diameter check, PNWRS	Integer
31	DIAHTCD	Diameter height code	Integer
32	DIST	Horizontal distance	Real
33	DRYBIO_BG	Dry biomass of the roots (CRM)	Real

	Column Name	Descriptive Name	Data Type
34	DRYBIO_BOLE	Dry biomass in the merchantable bole (CRM)	Real
35	DRYBIO_STUMP	Dry biomass in the tree stump (CRM)	Real
36	DRYBIO_TOP	Dry biomass in the top of the tree (CRM)	Real
37	DRYBIO_SAPLING	Dry biomass of saplings (CRM)	Real
38	DRYBIO_WDLD_SPP	Total dry biomass of woodland tree species (CRM)	Real
39	FORMCL	Form class	Integer
40	HTCD	Height method code	Integer
41	HRDWD_CLUMP_CD	Hardwood clump code	Integer
42	ROUGHCULL	Rough cull	Integer
43	STANDING_DEAD_CD	Standing dead code	Integer
44	STOCKING	Tree stocking	Real
45	TOTAGE	Total age	Integer
46	VOLBFGRS	Gross board-foot volume (Int ¼" rule)	Real
47	VOLBFNET	Net board-foot volume (Int ¼" rule)	Real
48	VOLCFGRS	Gross cubic-foot volume	Real
49	VOLCFNET	Net cubic-foot volume	Real
50	VOLCFSND	Sound cubic-foot volume	Real
51	VOLCSGRS	Gross cubic-foot volume in the sawlog portion	Real
52	VOLCSNET	Net cubic-foot volume in the sawlog portion	Real
53	WDLDSTEM	Woodland tree species stem count	Integer
Insect and Disease columns:			
54	AGENTCD	Cause of death (agent) code (dead trees)	Integer
55	DAMLOC1	Damage location 1	Integer
56	DAMLOC2	Damage location 2	Integer
57	DAMLOC1_PNWRS	Damage location 1, PNWRS	Integer
58	DAMLOC2_PNWRS	Damage location 2, PNWRS	Integer
59	DAMSEV1	Damage severity 1	Integer
60	DAMSEV2	Damage Severity 2	Integer
61	DAMTYP1	Damage type 1	Integer
62	DAMTYP2	Damage type 2	Integer
63	DMG_AGENT1_CD_PNWRS	Damage agent 1, PNW	Integer
64	DMG_AGENT2_CD_PNWRS	Damage agent 2, PNW	Integer
65	DMG_AGENT3_CD_PNWRS	Damage agent 3, PNW	Integer
66	UNKNOWN_DAMTYP1_PNWRS	Unknown damage type 1, PNW	Integer
67	UNKNOWN_DAMTYP2_PNWRS	Unknown damage type 2, PNW	Integer

	Column Name	Descriptive Name	Data Type
68	SEVERITY1_CD_PNWRS	Damage severity 1, PNW for years 2001-2004	Integer
69	SEVERITY1A_CD_PNWRS	Damage severity 1A, PNWRS	Integer
70	SEVERITY1B_CD_PNWRS	Damage severity 1B, PNWRS	Integer
71	SEVERITY2_CD_PNWRS	Damage severity 2, PNWRS for years 2001-2004	Integer
72	SEVERITY2A_CD_PNWRS	Damage severity 2A, PNWRS starting in 2005	Integer
73	SEVERITY2B_CD_PNWRS	Damage severity 2B, PNWRS starting in 2005	Integer
74	SEVERITY3_CD_PNWRS	Damage severity 3, PNWRS for years 2001-2004	Integer
75	MIST_CL_CD	Mistletoe class code	Integer
76	MIST_CL_CD_PNWRS	Leafy mistletoe class code, PNWRS	Integer
77	CYCLE	Inventory cycle number	Integer
78	SUBCYCLE	Inventory subcycle number	Integer

1. CN — Sequence number. A unique number used to identify a tree record. Referred to as TRE_CN in other tables. Use this column to link to the TREE_REGIONAL_BIOMASS or TREE_PNW tables.

2. PLT_CN — Plot sequence number. Foreign key linking the tree record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Link the TREE table to the COND table with PLT_CN and CONDID.

3. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

4. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

5. STATECD — State code.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

7. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

8. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

9. SUBP — Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD=1) has subplot number values of 1 through 4.

10. TREE — Tree record number. A number used to uniquely identify a tree on a subplot. Tree numbers can be used to track trees when PLOT.DESIGNCD is the same between inventories.

11. SPCD — Species code. A numeric FIA tree species code. Refer to appendix F for codes. Link to the FIADB Reference table to crosswalk codes into text: REF_SPECIES.

12. SPGRPCD — Species group code. A code assigned to each tree species in order to group them for reporting purposes on presentation tables. Codes and their associated names (see REF_SPECIES_GROUP.NAME) are shown in appendix G. Individual tree species and corresponding species group codes are shown in appendix F. Link to the FIADB Reference table to crosswalk codes into text: REF_SPECIES_GROUP.

Western softwood species groups

Code	Group name
10	Douglas-fir
11	Ponderosa and Jeffrey pines
12	True fir
13	Western hemlock
14	Sugar pine
15	Western white pine
16	Redwood
17	Sitka spruce
18	Engelmann and other spruces
19	Western larch
20	Incense-cedar
21	Lodgepole pine
22	Western redcedar
23	Woodland softwoods
24	Other western softwoods
25	Western juniper

Western hardwood species groups

Code	Group name
44	Cottonwood and aspen
45	Red alder
46	Oak
47	Other western hardwoods
48	Woodland hardwoods

13. STATUSCD — Status code. A code indicating whether the sample tree is live, cut, or dead at the time of measurement.

Code	Description
1	Live tree
2	Dead tree

14. TREECLCD — Tree class code. A code indicating the general quality of the tree. This is the tree class for both live and dead trees at the time of current measurement.

Code	Description
2	**Growing stock**: All live trees of commercial species that meet minimum merchantability standards. In general, these trees have at least one solid 8-foot section, are reasonably free of form defect on the merchantable bole, and at least 34 % or more of the volume is merchantable. For the California, Oregon, and Washington inventories, a 26 % or more merchantable volume standard is applied, rather than 34 % or more. Excludes rough or rotten cull trees.
3	**Rough cull**: All live trees that do not now, or prospectively, have at least one solid 8-foot section, reasonably free of form defect on the merchantable bole, or have 67 % or more of the merchantable volume cull; and more than half of this cull is due to sound dead wood cubic-foot loss or severe form defect volume loss. For the California, Oregon, and Washington inventories, 75 % or more cull, rather than 67 % or more cull, applies. This class also contains all trees of noncommercial species, or those species where SPGRPCD equals 23 (western woodland softwoods) or 48 (western woodland hardwoods). Refer to appendix F to find the species that have these SPGRPCD codes. For dead trees, this code indicates that the tree is salvable (sound).
4	**Rotten cull**: All live trees with 67 % or more of the merchantable volume cull, and more than half of this cull is due to rotten or missing cubic-foot volume loss. California, Oregon, and Washington inventories use a 75 % cutoff. For dead trees, this code indicates that the tree is nonsalvable (not sound).

15. TPA_UNADJ — Trees per acre unadjusted. The number of trees per acre that the sample tree theoretically represents based on the sample design. For fixed radius plots taken with the mapped plot design, TPA_UNADJ is set to a constant derived from the plot size and equals one of 3 values. Based on the procedures in Bechtold and Patterson (2005), this attribute can be adjusted using factors stored on the POP_STRATUM or PLOT_PNW table to derive population estimates.

Value (TPA)	Description
0.999188	For trees sampled on macroplots
6.018046	For trees sampled on subplots
74.965282	For trees sampled on microplots

16. DIA — Current diameter. The current diameter (in inches) of the sample tree at the point of diameter measurement. For additional information about where the tree diameter is measured, see DIAHTCD or HTDMP. DIA for live trees contains the measured value. DIA for cut and dead trees presents problems associated with uncertainty of when the tree was cut or died as well as structural deterioration of dead trees.

17. HT — Total height. (*Collected on trees that are >= 1.0 inch DIA for live trees and >= 5.0 inch DIA for standing dead trees*) The total length (height) of a sample tree (in feet) from the ground to the tip of the apical meristem. The total length of a tree is not always its actual length. If the main stem is broken, the actual length is measured or estimated and the missing piece is added to the actual length to estimate total length. The amount added is determined by measuring the broken piece if it can be located on the ground; otherwise it is estimated. The minimum height for timber species is 5 feet and for woodland species is 1 foot.

18. ACTUALHT — Actual height. The length (height) of the tree to the nearest foot from ground level to the highest remaining portion of the tree still present and attached to the bole. If ACTUALHT = HT, then the tree does not have a broken top. If ACTUALHT < HT, then the tree does have a broken or missing top. The minimum height for timber species is 5 feet and for woodland species is 1 foot.

19. AZIMUTH — Azimuth. The direction, to the nearest degree, from subplot center (microplot center for saplings) to the center of the base of the tree (geographic center for multi-stemmed woodland species). Due north is represented by 360 degrees. This attribute is populated for live and standing dead trees in a forest condition that were measured on any of the four subplots of the national plot design. It may be populated for other tree records.

20. BHAGE — Breast height age. The age of a live tree derived from counting tree rings from an increment core sample extracted at a height of 4.5 feet above ground. Breast height age is collected for a subset of trees and only for trees that the diameter is measured at breast height (DBH). This data item is used to calculate classification variables such as stand age. For PNWRS, one tree is sampled for BHAGE for each species, within each crown class, and for each condition class present on a plot. Age of saplings (< 5.0 inches DBH) may be aged by counting branch whorls above 4.5 feet. No timber hardwood species other than red alder are bored for age.

21. BORED_CD_PNWRS — Tree bored code, Pacific Northwest Research Station. Used in conjunction with tree age (BHAGE and TOTAGE).

Code	Description
1	Trees bored or ‘whorl counted’ at the current inventory
2	Tree age derived from a previous inventory
3	Tree age was extrapolated

22. CARBON_AG — Carbon in the aboveground portion of the tree. Based on CRM (see appendix J). The carbon (pounds) in the aboveground portion, excluding foliage, of live trees with a diameter ≥1 inch, and dead trees with a diameter ≥5 inches. This estimate includes both modeled and measured columns. Calculated for both timber and woodland species. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Carbon is assumed to be one-half the value of biomass and is derived by summing the aboveground biomass estimates and multiplying by 0.5 as follows:

CARBON_AG = 0.5 * (DRYBIO_BOLE + DRYBIO_STUMP + DRYBIO_TOP + DRYBIO_SAPLING + DRYBIO_WDLD_SPP)

23. CARBON_BG — Carbon in the belowground portion of the tree. Based on CRM (see appendix J). The carbon (pounds) of coarse roots >0.1 inch in root diameter. This is a **modeled** estimate,estimate, which is calculated for live trees with a diameter ≥1 inch, and dead trees with a diameter ≥5 inches, for both timber and woodland species. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Carbon is assumed to be one-half the value of belowground biomass as follows: CARBON_BG = 0.5 * DRYBIO_BG

24. CCLCD — Crown class code. A code indicating the amount of sunlight received and the crown position within the canopy.

Code	Description
1	Open grown: Trees with crowns that have received full light from above and from all sides throughout all or most of their life, particularly during early development.
2	Dominant: Trees with crowns extending above the general level of the canopy and receiving full light from above and partly from the sides; larger than the average trees in the stand, and with crowns well developed, but possibly somewhat crowded on the sides.
3	Codominant: Trees with crowns forming part of the general level of the crown cover and receiving full light from above, but comparatively little from the side. Usually with medium crowns more or less crowded on the sides.
4	Intermediate: Trees shorter than those in the preceding two classes, with crowns either below or extending into the canopy formed by the dominant and codominant trees, receiving little direct light from above, and none from the sides; usually with small crowns very crowded on the sides.
5	Overtopped: Trees with crowns entirely below the general canopy level and receiving no direct light either from above or the sides.

25. CR — Compacted crown ratio. The percent of the tree bole supporting live, healthy foliage (the crown is ocularly compacted to fill in gaps) when compared to actual length (ACTUALHT).

26. CULL — Rotten and missing cull. The percent of the cubic-foot volume in a live or dead tally tree that is rotten or missing. This is a calculated value that includes field-recorded cull (CULL_FLD) and any additional cull due to broken top.

27. CULL_FLD — Rotten/missing cull, field call. The percentage rotten or missing cubic-foot cull volume, estimated to the nearest 1 percent. This estimate does not include any cull estimate above actual length; therefore volume lost from a broken top is not included (see CULL for percent cull including cull from broken top). When field crews estimate volume loss (tree cull), they only consider the cull on the merchantable bole/portion of the tree, from a 1-foot stump to a 4-inch top diameter outside bark (DOB). For western woodland species, the merchantable portion is between the point of DRC measurement to a 1.5-inch top DOB.

28. DECAYCD — Decay class code. A code indicating the stage of decay in a standing dead tree.

Code	Description
1	All limbs and branches are present; the top of the crown is still present; all bark remains; sapwood is intact, with minimal decay; heartwood is sound and hard
2	There are few limbs and no fine branches; the top may be broken; a variable amount of bark remains; sapwood is sloughing with advanced decay; heartwood is sound at base but beginning to decay in the outer part of the upper bole
3	Only limb stubs exist; the top is broken; a variable amount of bark remains; sapwood is sloughing; heartwood has advanced decay in upper bole and is beginning at the base
4	Few or no limb stubs remain; the top is broken; a variable amount of bark remains; sapwood is sloughing; heartwood has advanced decay at the base and is sloughing in the upper bole
5	No evidence of branches remains; the top is broken; less than 20% of the bark remains; sapwood is gone; heartwood is sloughing throughout

29. DIACHECK — Diameter check code. A code indicating the reliability of the diameter measurement. Note: If both codes 1 and 2 apply, code 2 is used.

Code	Description
0	Diameter accurately measured
1	Diameter estimated
2	Diameter measured at different location than previous measurement

30. DIACHECK_PNWRS — Diameter check PNW Research Station. A separate estimate of the diameter without the obstruction if the diameter was estimated because of an obstruction by moss/vines, etc. Only collected by PNW.

Code	Description
5	Diameter estimated because of moss.
6	Diameter estimated because of vines.
7	Diameter estimated (double nail diameter)

31. DIAHTCD — Diameter height code. A code indicating the location at which DIA was measured.

Code	Description
1	Breast height (DBH) – All timber tree species are measured here
2	Root collar (DRC) -- All **woodland** tree species are measured here

32. DIST — Horizontal distance. The horizontal distance in feet from subplot center (microplot center for saplings) to the center of the base of the tree (geographic center for multi-stemmed woodland species). This attribute is populated for live and standing dead trees in a forest condition that were measured on any of the four subplots.

33. DRYBIO_BG — Dry biomass of the roots, CRM method. The oven-dry biomass (pounds) of the belowground portion of a tree, includes coarse roots with a root diameter ≥0.1 inch. This is a **modeled** estimate, calculated on live trees with a diameter of ≥1 inch and dead trees with a diameter of ≥5 inches, for both timber and woodland. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Appendix J contains equations used to estimate biomass components in the FIADB.

34. DRYBIO_BOLE — Dry biomass in the merchantable bole, CRM method. The oven-dry biomass (pounds) in the merchantable bole of timber species [trees where diameter is measured at breast height (DBH)] ≥5 inches in diameter. This is the biomass of sound wood in live and dead trees, including bark, from a 1-foot stump to a minimum 4-inch top diameter of the central stem. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for timber species with DIA <5.0 inches and for woodland species. See DRYBIO_WDLD_SPP for biomass of woodland species and DRYBIO_SAPLING for biomass of timber species with DIA <5 inches. For dead or cut timber trees, this number represents the biomass at the time of death or last measurement. DRYBIO_BOLE is based on VOLCFSND and specific gravity information derived by the Forest Products Lab and others (values stored in the REF_SPECIES table). If VOLCFSND is not available, then either VOLCFGRS * Percent Sound or VOLCFNET * (average ratio of cubic foot sound to cubic foot net volume, calculated as national averages by species group and diameter) is used. Appendix J contains equations used to estimate biomass components in the FIADB.

35. DRYBIO_STUMP — Dry biomass in the tree stump, CRM method. The ovendry biomass (pounds) in the stump of timber species [trees where diameter is measured at breast height (DBH)] ≥ 5 inches in diameter. The stump is that portion of the tree from the ground to the bottom of the merchantable bole (i.e., 1 foot). This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This is a **modeled** estimate, which is calculated for live and dead trees. For dead or cut trees, this number represents the biomass at the time of death or last measurement. This attribute is blank (null) for timber species with DIA < 5.0 inches and for woodland species. See DRYBIO_WDLD_SPP for biomass of woodland species, and DRYBIO_SAPLING for biomass of trees with DIA < 5 inches. Appendix J contains equations used to estimate biomass components in the FIADB.

36. DRYBIO_TOP — Dry biomass in the top of the tree, CRM method. The oven-dry biomass (pounds) in the top and branches (combined) of timber species [trees where diameter is measured at breast height (DBH)] ≥5 inches in diameter. DRYBIO_TOP includes the tip, the portion of the stem above the merchantable bole (i.e., above the 4-inch top diameter), and all branches; excludes foliage. This is a **modeled** estimate, estimated for live and dead trees. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. For dead or cut trees, this number represents the biomass at the time of death or last measurement. This attribute is blank (null) for timber species with DIA <5.0 inches and for woodland species. See DRYBIO_WDLD_SPP for biomass of woodland species, and DRYBIO_SAPLING for biomass of timber species with DIA <5.0 inches. Appendix J contains equations used to estimate biomass components in the FIADB.

37. DRYBIO_SAPLING Dry biomass of saplings, CRM method. The ovendry biomass (pounds) of the aboveground portion, excluding foliage, of live trees with a diameter from 1 to 4.9 inches. This is a **modeled** estimate, which is calculated for timber species only. The biomass of saplings is based on biomass computed from Jenkins and others (2003), using the observed diameter and an adjustment factor. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Appendix J contains equations used to estimate biomass components in the FIADB.

38. DRYBIO_WDLD_SPP Dry biomass of woodland tree species, CRM method. The oven-dry biomass (pounds) of the aboveground portion of a live or dead tree, excluding foliage, the tree tip (top of the tree above 1½ inches in diameter), and a portion of the stump from ground to diameter at root collar (DRC). This is a **modeled** estimate, calculated for woodland species (trees where diameter is measured at DRC) with a diameter ≥1 inch. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for woodland species with DIA <1.0 inch and for all timber species. Appendix J contains equations used to estimate biomass components in the FIADB.

39. FORMCL Form class. A code used in calculating merchantable bole net volume. Recorded for all live hardwood trees tallied that are ≥ 5.0 inch DBH/DRC. Also recorded for conifers ≥ 5.0 inch DBH in Region 5 National Forests. Only collected by PNW.

Code	Description
1	First 8 feet above stump is straight
2	First 8 feet above stump is NOT straight or forked; but there is at least one straight 8-foot log elsewhere in the tree
3	No 8-foot logs anywhere in the tree now or in the future due to form.

40. HTCD Height method code. A code indicating how length (height) was determined.

Code	Description
1	Field measured (total and actual length)
2	Total length visually estimated in the field, actual length measured.
3	Total and actual lengths are visually estimated
4	Estimated with a model

41. HRDWD_CLUMP_CD
Hardwood clump code. A code sequentially assigned to identify each hardwood clump within each species as they are found on a subplot. Up to 9 hardwood clumps can be identified and coded within each species on each subplot. A clump is defined as having 3 or more live stems originating from a common point on the root system. Western woodland hardwood species are not evaluated for clump code. Clump code data is used to adjust stocking estimates since trees growing in clumps contribute less to stocking than do individual trees. Only collected by PNW.

42. ROUGHCULL Rough cull. Percentage of sound dead cull, as a percent of the merchantable bole/portion of the tree.

43. STANDING_DEAD_CD

Standing dead code. A code indicating if a tree qualifies as standing dead. To qualify as a standing dead tally tree, the dead tree must be at least 5.0 inches in diameter, have a bole that has an unbroken actual length of at least 4.5 feet, and lean less than 45 degrees from vertical as measured from the base of the tree to 4.5 feet.

For western woodland species with multiple stems, a tree is considered down if more than 2/3 of the volume is no longer attached or upright; cut and removed volume is not considered. For western woodland species with single stems to qualify as a standing dead tally tree, dead trees must be at least 5.0 inches in diameter, be at least 1.0 foot in unbroken ACTUAL LENGTH, and lean less than 45 degrees from vertical.

Code	Description
0	No – tree does not qualify as standing dead
1	Yes – tree does qualify as standing dead (snag)

44. STOCKING

Tree stocking. The stocking value computed for each live tree. Stocking values are computed using several specific species equations that were developed from normal yield tables and stocking charts. Resultant values are a function of diameter. The stocking of individual trees is used to calculate COND.GSSTK, COND.GSSTKCD, COND.ALSTK, and COND.ALSTKCD.

45. TOTAGE

Total age. The age of a live tree derived either from counting tree rings from an increment core sample extracted at the base of a tree where diameter is measured at root collar (DRC), or for small saplings (1.0 to 2.9 inches diameter at breast height) by counting all branch whorls, or by adding a species-dependent number of years to breast height age. Total age is collected for a subset of trees and is used to calculate classification variables such as stand age.

46. VOLBFGRS

Gross board-foot volume in the sawlog portion. This is the total volume (International ¼-inch rule) of wood in the central stem of a timber species tree of sawtimber size (9.0 inches DIA minimum for softwoods, 11.0 inches DIA minimum for hardwoods), from a 1-foot stump to a minimum top diameter (7.0 inches for softwoods, 9.0 inches for hardwoods), or to where the central stem breaks into limbs all of which are less than the minimum top DIA. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per unit area information. This attribute is blank (null) for softwood trees with DIA <9.0 inches (11.0 inches for hardwoods). All larger trees should have entries in this field if they are growing-stock trees (TREECLCD = 2 and STATUSCD = 1). All rough and rotten trees (TREECLCD = 3 or 4) and dead and cut trees (STATUSCD = 2 or 3) are blank (null) in this field.
Note that Scribner volume is available in the TREE_PNW table.

Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

47. VOLBFNET — Net board-foot volume in the sawlog portion. This is the net volume (International ¼-inch rule) of wood in the central stem of a timber species tree of sawtimber size (9.0 inches DIA minimum for softwoods, 11.0 inches DIA minimum for hardwoods), from a 1-foot stump to a minimum top diameter (7.0 inches for softwoods, 9.0 inches for hardwoods), or to where the central stem breaks into limbs all of which are less than the minimum top diameter. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per unit area information. This attribute is blank (null) for softwood trees with DIA <9.0 inches (11.0 inches for hardwoods). All larger trees should have entries in this field if they are growing-stock trees (TREECLCD = 2 and STATUSCD = 1). All rough and rotten trees (TREECLCD = 3 or 4) and dead and cut trees (STATUSCD = 2 or 3) are blank (null) in this field.
Note that Scribner volume is available in the TREE_PNW table.

Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

48. VOLCFGRS — Gross cubic-foot volume. For timber species (trees where the diameter is measured at breast height [DBH]), this is the total volume of wood in the central stem of sample trees ≥5.0 inches in diameter, from a 1-foot stump to a minimum 4-inch top diameter, or to where the central stem breaks into limbs all of which are <4.0 inches in diameter. For woodland species (REF_SPECIES.WOODLAND = X ; trees where the diameter is measured at root collar [DRC]), VOLCFGRS is the total volume of wood and bark from the DRC measurement point(s) to a 1 ½ -inch top diameter; includes branches that are at least 1½ inches in diameter along the length of the branch. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for trees with DIA <5.0 inches. All trees measured after 1998 with DIA ≥5.0 inches (including dead and cut trees) have entries in this field. Includes rotten, missing and form cull (volume loss due to rotten, missing, and form cull defect has not been deducted).

Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

49. VOLCFNET — Net cubic-foot volume. For timber species (trees where the diameter is measured at breast height [DBH]), this is the net volume of wood in the central stem of a sample tree ≥5.0 inches in diameter, from a 1-foot stump to a minimum 4-inch top diameter, or to where the central stem breaks into limbs all of which are <4.0 inches in diameter. For woodland species (REF_SPECIES.WOODLAND = X ; trees where the diameter is measured at root collar [DRC]), VOLCFNET is the net volume of wood and bark from the DRC measurement point(s) to a 1 ½ -inch top diameter; includes branches that are at least 1½ inches in diameter along the length of the branch. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for trees with DIA <5.0 inches. All trees with DIA ≥5.0 inches (including dead and cut trees) will have entries in this field. Does not include rotten, missing, and form cull (volume loss due to rotten, missing, and form cull defect has been deducted).

Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

50. VOLCFSND — Sound cubic-foot volume. For timber species (trees where the diameter is measured at breast height [DBH]), the volume of sound wood in the central stem of a sample tree ≥5.0 inches in diameter from a 1-foot stump to a minimum 4-inch top diameter or to where the central stem breaks into limbs all of which are <4.0 inches in diameter. For woodland species (trees where the diameter is measured at root collar [DRC]), VOLCFSND is the net volume of wood and bark from the DRC measurement point(s) to a minimum 1½ -inch top diameter; includes branches that are at least 1½ inches in diameter along the length of the branch. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for trees with DIA <5.0 inches. All trees with DIA ≥5.0 inches (including dead trees) have entries in this field. Does not include rotten and missing cull (volume loss due to rotten and missing cull defect has been deducted).

    Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

51. VOLCSGRS — Gross cubic-foot volume in the sawlog portion. This is the total volume of wood in the central stem of a timber species tree of sawtimber size (9.0 inches DIA minimum for softwoods, 11.0 inches DIA minimum for hardwoods), from a 1-foot stump to a minimum top diameter (7.0 inches for softwoods, 9.0 inches for hardwoods), or to where the central stem breaks into limbs, all of which are less than the minimum top diameter. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for softwood trees with DIA <9.0 inches (11.0 inches for hardwoods). All larger trees have entries in this field if they are growing-stock trees (TREECLCD = 2 and STATUSCD = 1). All rough and rotten trees (TREECLCD = 3 or 4) and dead and cut trees (STATUSCD = 2 or 3) are blank (null) in this field.

    Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

52. VOLCSNET — Net cubic-foot volume in the sawlog portion. The net volume of wood in the central stem of a timber species tree of sawtimber size (9.0 inches DIA minimum for softwoods, 11.0 inches DIA minimum for hardwoods), from a 1-foot stump to a minimum top diameter, (7.0 inches for softwoods, 9.0 inches for hardwoods) or to where the central stem breaks into limbs, all of which are less than the minimum top diameter. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for softwood trees with DIA <9.0 inches (11.0 inches for hardwoods). All larger trees have entries in this field if they are growing-stock trees (TREECLCD = 2 and STATUSCD = 1). All rough and rotten trees (TREECLCD = 3 or 4) and dead and cut trees (STATUSCD = 2 or 3) are blank (null) in this field.

    Alternatively, you can multiply the volume by TREE_PNW.TPA_ADJ to simplify the calculation and summary of volume with the PNW-FIADB database.

53. WDLDSTEM — Woodland tree species stem count. Used for tree species where diameter is measured at the root collar. For a stem to be counted, it must have a minimum stem size of 1 inch in diameter and 1 foot in length. Blank (null) if not a woodland species.

Damage Information----SEE supporting documents in the 'Documentation' folder for changes over time

54. AGENTCD — Cause of death (agent) code. When MANUAL ≥ 1.0, this variable is collected on only some **dead** and cut trees. Damage recorded for dead trees was the cause of death. When the cause of death could not be determined for a tree, 99 was recorded.

Code	Description
00	No agent recorded
10	Insect
20	Disease
30	Fire
40	Animal
50	Weather
60	Vegetation (e.g., suppression, competition, vines/kudzu)
70	Unknown/not sure/other – includes death from human activity not related to silvicultural or land clearing activity (accidental, random, etc). TREE NOTES required.
80	Silvicultural or land clearing activity (death caused by harvesting or other silvicultural activity, including girdling, chaining, etc., or to land clearing activity.

55.DAMLOC1 — Damage location 1. (*Core where PLOT.MANUAL=1.0 through 1.6; Core optional beginning with PLOT.MANUAL=1.7*) A code indicating where damage (meeting or exceeding a severity threshold, as defined in the field guide) is present on the tree.

Code	Description
0	No damage
1	Roots (exposed) and stump (up to 12 inches from ground level)
2	Roots, stump, and lower bole
3	Lower bole (lower half of bole between stump and base of live crown)
4	Lower and upper bole
5	Upper bole (upper half of bole between stump and base of live crown)
6	Crownstem (main stem within the live crown)
7	Branches (> 1 inch diameter at junction with main stem and in the live crown)
8	Buds and shoots of current year
9	Foliage

56. DAMLOC2 — Damage location 2.(*Core where PLOT.MANUAL=1.0 through 1.6; Core optional beginning with PLOT.MANUAL=1.7*) A code indicating where secondary damage (meeting or exceeding a severity threshold, as defined in the field guide) is present. Use same codes as DAMLOC1. If DAMLOC1 = 0, then DAMLOC2 = blank or 0.

57. DAMLOC1_PNWRS — Damage location 1, Pacific Northwest Research Station. The location on the tree where Damage Type 1 is found. Only collected by PNW.

Code	Location	Definition
0		No damage found.
1	Roots	Above ground up to 12 inches on bole.
2	Bole	Main stem(s) starting at 12 inches above the ground, including forks up to a 4 inch top. (A fork is at least equal to 1/3 diameter of the bole, and occurs at an angle < 45 degrees in relation to the bole.) This is not a valid location code for woodland species; use only 1, 3 ,and 4.
3	Branch	All other woody material. Primary branch(s) occur at an angle ≥ 45 ° in relation to the bole.
4	Foliage	All leaves, buds, and shoots.

58. DAMLOC2_PNWRS Damage location 2, Pacific Northwest Research Station. See DAMLOC1_PNWRS.

59. DAMSEV1 Damage severity 1. (*Core where PLOT.MANUAL=1.0 through 1.6; Core optional beginning with PLOT.MANUAL=1.7*) A code indicating how much of the tree is affected. Valid severity codes vary by damage type and damage location and must exceed a threshold value, as defined in the field guide. If DAMLOC1 = 0, then DAMSEV1 = blank (null).

Code	Description
0	01 to 09 % of location affected
1	10 to 19 % of location affected
2	20 to 29 % of location affected
3	30 to 39 % of location affected
4	40 to 49 % of location affected
5	50 to 59 % of location affected
6	60 to 69 % of location affected
7	70 to 79 % of location affected
8	80 to 89 % of location affected
9	90 to 99 % of location affected

60. DAMSEV2 Damage severity 2. (*Core where PLOT.MANUAL=1.0 through 1.6; Core optional beginning with PLOT.MANUAL=1.7*) A code indicating how much of the tree is affected by the secondary damage. Valid severity codes vary by damage type and damage location and must exceed a threshold value, as defined in the field guide. Use same codes as DAMSEV1. If DAMLOC1 = 0, then DAMSEV2 = blank (null).

61. DAMTYP1 Damage type 1. (*Core where PLOT.MANUAL=1.0 through 1.6; Core optional beginning with PLOT.MANUAL=1.7*) A code indicating the kind of damage (meeting or exceeding a severity threshold, as defined in the field guide) present. If DAMLOC1 = 0, then DAMTYP1 = blank (null).

Code	Description
01	Canker, gall
02	Conk, fruiting body, or sign of advanced decay
03	Open wound
04	Resinosis or gumosis
05	Crack or seam
11	Broken bole or broken root within 3 feet of bole
12	Broom on root or bole
13	Broken or dead root further than 3 feet from bole
20	Vines in the crown
21	Loss of apical dominance, dead terminal
22	Broken or dead branches
23	Excessive branching or brooms within the live crown
24	Damaged shoots, buds, or foliage
25	Discoloration of foliage
31	Other

62. DAMTYP2 Damage type 2. (*Core where PLOT.MANUAL=1.0 through 1.6; Core optional beginning with PLOT.MANUAL=1.7*) A code indicating the kind of secondary damage (meeting or exceeding a severity threshold, as defined in the field guide) present. Use same codes as DAMTYP1. If DAMLOC1 = 0, then DAMTYP2 = blank (null).

63. DMG_AGENT1_CD_PNWRS

Damage agent 1-- Primary damage agent code in PNW. Up to three damaging agents can be coded in PNW as DMG_AGENT1_CD_PNWRS, DMG_AGENT2_CD_PNWRS, and DMG_AGENT3_CD_PNWRS. A code indicating the tree damaging agent that is considered to be of greatest importance to predict tree growth, survival, and forest composition and structure. Additionally, there are two classes of damaging agents. Class one damage agents are considered more important than class two agents and are thus coded as a primary agent before the class two agents. **For codes and more information, see appendix H**. Only collected by PNW.

64. DMG_AGENT2_CD_PNWRS

DAMAGE AGENT 2. See DAM_AGENT1_CD_PNWRS. Only collected by PNW.

65. DMG_AGENT3_CD_PNWRS

DAMAGE AGENT 3 See DAM_AGENT1_CD_PNWRS. Only collected by PNW

66. UNKNOWN_DAMTYP1_PNWRS

Unknown damage type 1, Pacific Northwest Research Station. A code indicating the sign or symptom recorded when UNKNOWN damage code 90 is used and recorded in DMG_AGENT1/2/3_CD_PNWRS.

Code	Description
1	canker/gall
2	open wound
3	resinosis
4	broken
5	damaged or discolored foliage
6	other

67. UNKNOWN_DAMTYP2_PNWRS

Unknown damage type 2, Pacific Northwest Research Station. See UNKNOWN_DAMTYP1_PNWRS.

68. SEVERITY1_CD_PNWRS

Damage severity 1, Pacific Northwest Research Station for years 2001-2004. Damage severity depends on the damage agent coded (see appendix H for codes) This is a 2-digit code that indicates either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-9 depending on the specific Damage Agent).

69. SEVERITY1A_CD_PNWRS

Damage severity 1A, Pacific Northwest Research Station. Damage severity depends on the damage agent coded (see appendix H for codes). This is a 2-digit code indicating either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-4 depending on the specific Damage Agent).

70. SEVERITY1B_CD_PNWRS

Damage severity 1B, Pacific Northwest Research Station. Damage severity B is only coded when the Damage Agent is white pine blister rust (36).

Code	Description
1	Branch infections located more than 2.0 feet from tree bole.
2	Branch infections located 0.5 to 2.0 feet from tree bole.
3	Branch infection located within 0.5 feet of tree bole OR tree bole infection present.

71. SEVERITY2_CD_PNWRS

Damage severity 2, Pacific Northwest Research Station for years 2001-2004. Damage severity depends on the damage agent coded (see appendix H for codes). This is a 2-digit code indicating either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-9 depending on the specific Damage Agent).

72. SEVERITY2A_CD_PNWRS

Damage severity 2A, Pacific Northwest Research Station starting in 2005. See SEVERITY1A_CD_PNWRS.

73. SEVERITY2B_CD_PNWRS

Damage severity 2B, Pacific Northwest Research Station starting in 2005. See SEVERITY1B_CD_PNWRS.

74. SEVERITY3_CD_PNWRS

Damage severity 3, PNW for years 2001-2004. Damage severity depends on the damage agent coded (see appendix H for codes). This is a 2-digit code indicating either % of location damaged (01-99), or the appropriate class of damage (values vary from 0-9 depending on the specific Damage Agent). Only collected PNW.

75. MIST_CL_CD Dwarf Mistletoe class code. A rating of **dwarf mistletoe** infection.

Recorded on all live conifer species **except** juniper. Using the Hawksworth (1979) six-class rating system, the live crown is divided into thirds, and each third is rated using the following scale: 0 is for no visible infection, 1 for less than 50% of branches infected, 2 for more than 50% of branches infected. The ratings for each third are summed together to yield the Hawksworth rating.

Code	Hawksworth tree DMR rating	Code	Hawksworth tree DMR rating
0	no infection	4	medium infection
1	light infection	5	heavy infection
2	light infection	6	heavy infection
3	medium infection		

76. MIST_CL_CD_PNWRS

Leafy mistletoe class code. All juniper species, incense cedars, white fir (CA only) and oak trees are rated for leafy mistletoe infection. This item is used to describe the extent and severity of leafy mistletoe infection (see MIST_CL_CD for dwarf mistletoe information). Only collected by PNW.

Code	Description
0	None
7	< 50 percent of crown infected
8	>=50 percent of crown infected or any occurrence on the bole

77. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

78. SUBCYCLE Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

TREE_PNW –table (Contains regional PNW measured or calculated data for trees)

	Column Name	Descriptive Name	Data Type
1	TRE_CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CND_CN	Condition sequence number	Text
4	INVYR	Inventory year	Integer
5	STATECD	State code	Integer
6	CONDID	Condition class number	Integer
7	SPECIES_BROAD_GROUPS	Broad species groups	Integer
8	BASAL_AREA	Basal area per tree, square feet	Real
9	TPA_ADJ	Adjusted trees per acre for most recent 10 years	Real
10	TPA_ADJ_2010	Adjusted trees per acre for first 10 years of annual inventory	Real
11	TPA_UNADJ_COND	Adjusted trees per acre for 2001-2010/2002-2011 summaries	Real
12	PLOT_RADIUS	Radius of the plot where tree was sampled	Real
13	VOLBFNET_SCRIBNER	Board foot net volume, Scribner rule	Real
14	VOLBFGRS_SCRIBNER	Board foot gross volume, Scribner rule	Real
15	VOLCFGRS_TOTAL_STEM_WOOD	Cubic volume of wood in the total stem, ground to tip (does not include bark)	Real
16	CAVITY_USE_PNWRS	Cavity or den is present, used by wildlife.	Integer
17	INC10YR_PNWRS	Ten year bored radial increment	Integer
18	INC5YR_PNWRS	Five year bored radial increment	Integer
19	INC5YRHT_PNWRS	Five-year height growth of saplings	Integer
20	MOSS_ABUN_CD_PNWRS	Moss abundance on top surface of limbs	Integer
21	PLAT_ABUN_CD_PNWRS	Number of limbs that contain a platform	Integer
22	REMNANT_CD_PNWRS	Remnant tree identifier	Integer
23	TAG_NO_PNWRS	Tree tag number	Integer
24	STATUSCD	Status code of the tree	Integer

1. TRE_CN — Tree sequence number. Foreign key linking the TREE_PNW record to the TREE record. This TRE_CN is the same as the CN in the TREE table. To use, link TREE_PNW.TRE_CN = TREE.CN.

2. PLT_CN — Plot sequence number. Foreign key linking the TREE_PNW record to the plot record. A unique number that identifies every record in the PLOT table. It is also a foreign key linking the records in this table to the plot record in any other table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number.

3. CND_CN — Condition sequence number. Unique number that identifies every record in the COND table. Here, it is a foreign key linking the records in this table to the records in the COND table or any other table that contains CND_CN. The CND_CN column is found in many FIADB tables, and is usually one of the key columns you will use to link to other tables. In the COND table, the column name is simply CN. Note that CND_CN is not the condition class number. .
To use, link TREE_PNW.CND_CN = COND.CN.

4. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

5. STATECD — State code.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

6. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

7. SPECIES_BROAD_GROUPS
Broad species groups. A descriptive name that describes which group a species belongs to. The codes are 'Softwoods' or 'Hardwoods', which are used to organize output in queries or reports.

8. BASAL_AREA — Basal area of all live trees over 1 inch DIA, in square-feet.
The formula used was .005454*DIA^2.

9. TPA_ADJ — Trees per acre **adjusted**. The number of trees per acre that the sample tree represents based on the sample design, which has also been adjusted for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. This adjusted trees per acre is valid for the current annual inventory stratification. It is provided to make it easier to create queries to summarize and analyze the data.

TPA_ADJ is based on the plot size where the tally tree was located. It was calculated as follows:
If TPA_UNADJ = .999188 then TPA_ADJ= TPA_UNADJ * ADJ_FACTOR_MACR
If TPA_UNADJ = 6.018046 then TPA_ADJ= TPA_UNADJ * ADJ_FACTOR_SUBP
If TPA_UNADJ = 74.965282 then TPA_ADJ= TPA_UNADJ * ADJ_FACTOR_MICR

The formulas are based on procedures in Bechtold and Patterson (2005), which describes how this attribute can be adjusted with factors stored on the

POP_STRATUM table (ADJ_FACTOR_MACR,ADJ_FACTOR_SUBP,ADJ_FACTOR_MICR). Adjustment factors are also stored in the PLOT_PNW table. The adjustment is necessary to derive population estimates.

Examples of how this column is used to expand a tree attribute are shown below:
Net cubic volume per acre = VOLCFNET * TPA_ADJ
Net cubic volume (population estimate) = VOLCFNET * TPA_ADJ * EXPVOL
Or, more explicitly:
Net cubic volume, in cubic feet =
TREE.VOLCFNET * TREE_PNW.TPA_ADJ * PLOT_PNW.EXPVOL

10. TPA_ADJ_2010 Trees per acre adjusted, for the 2001-2010(CAOR) or 2002-2011(WA), inventories. The number of trees per acre that the sample tree represents based on the sample design, which has also been adjusted for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. This TPA would be used when summarizing data for the inventory years of 2001-2010(CAOR) or 2002-2011(WA) when estimating information to accompany DWM summaries.

11. TPA_UNADJ_COND Trees per acre unadjusted, weighted by the condition proportion (MACRPROP_UNADJ, SUBPPROP_UNADJ, MICRPROP_UNADJ) for the tree size. This trees per acre can be used to sum the TPA to the condition level.

12. PLOT_RADIUS Radius of the plot where tree was sampled

13. VOLBFNET_SCRIBNER
Net board-foot volume (ft2) in the sawlog portion of a tree. This is the net volume (**Scribner rule**) of wood in the central stem of a commercial species tree of sawtimber size (9.0 inches DIA minimum for softwoods, 11.0 inches DIA minimum for hardwoods), from a 1-foot stump to a minimum top DOB (7.0 inches for softwoods, 9.0 inches for hardwoods), or to where the central stem breaks into limbs all of which are less than the minimum top DOB. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per unit area information. Trees with DIA less than 9.0 inches (or < 11.0 inches for hardwoods) are null in this field.

14. VOLBFGRS_SCRIBNER
Gross board-foot volume (ft2) in the sawlog portion. This is the total volume (**Scribner rule)** of wood in the central stem of a sample commercial species tree of sawtimber size (9.0 inches DIA minimum for softwoods, 11.0 inches DIA minimum for hardwoods), from a 1-foot stump to a minimum top DOB (7.0 inches for softwoods, 9.0 inches for hardwoods), or to where the central stem breaks into limbs all of which are less than the minimum top DOB. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per unit area information. Trees with DIA less than 9.0 inches (or < 11.0 inches for hardwoods) have zero in this field.

15. VOLCFGRS _TOTAL_STEM_WOOD
Cubic volume of wood in the total stem, ground to tip, in cubic feet. Includes wood volume (inside bark) of the entire tree, and does not exclude rot, rough, or other types of cull volume. Calculated on live trees >= 1 inch DIA and dead trees >= 5 inches DIA. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information.

16. CAVITY_USE_PNWRS

Cavity or den is present and used by wildlife. All live and standing dead tally trees that are >= 5 inches DIA are examined to determine if a cavity or den is present and an approximate size. A cavity must be usable by wildlife (birds, small mammals, large mammals) to be coded. If more than one cavity is present, the largest is recorded. The codes indicate presence or absence and size.

Code	Description
0	No cavity or den present
1	Cavity or den present < 6.0 inches
2	Cavity or den present >=6.0 inches

17. INC10YR_PNWRS The bored radial ten-year increment inside bark. All trees bored for tree age with an increment borer at the current visit have a radial increment recorded to the nearest 1/20th inch for a 10-year period. The tree is bored just below the point of diameter measurement, on the side of the tree facing the point. The length of 10 growth rings from the cambium is measured to the nearest 1/20th inches to get radial increment, which is recorded as the number of twentieths, e.g. 18/20 is recorded "18" and 27/20 is recorded "27". Please see the field manual for illustrations and more information on the measurement techniques.

18. INC5YR_PNWRS The bored radial five-year increment inside bark. All trees bored for tree age with an increment borer at the current visit have a radial increment recorded to the nearest 1/20th inch for a 10-year period. The tree is bored just below the point of diameter measurement, on the side of the tree facing the point. The length of 5 growth rings from the cambium is measured to the nearest 1/20th inches to get radial increment, which is recorded as the number of twentieths, e.g. 18/20 is recorded "18" and 27/20 is recorded "27". Please see the field manual for illustrations and more information on the measurement techniques.

19. INC5YRHT_PNWRS Five year height growth increment of saplings. The 5-year height growth increment of saplings (trees >= 1.0 in and < 5.0 inches DBH), measured to the nearest 0.1 foot. For Region 5 and Region 6 national forests only. The height increment is measured by beginning at the sixth branch whorl from the top of the tree and recording the length to the first branch whorl from the top. False whorls and the current year's growth were not included. Crews started from North and worked in a clockwise direction on each microplot. The 5-year height growth measurement was taken for at least the first tree representing each species, in each crown class, for each condition class present on the plot for which a bored increment has not already been measured. Please see the field manual for illustrations and more information on the measurement techniques.

20. PLAT_ABUN_CD_PNWRS

The number of limbs that contain one or more platforms. Limbs with multiple platforms are counted once, regardless of the number of platforms on the limb. Limb counts from 1 to 9 are tallied as individuals (i.e. 1, 2, 3, etc.). A tree with 10 or greater limbs with one or more platforms are tallied as 10. This is part of a special study and is not collected on all trees.

A platform is a section or area of a live limb that is > 6.0 inches diameter, located > 33.0 feet above the ground up to the top of a live crown of a tree. The platform should not be positioned at more than a 45 degree angle from horizontal. This includes limb areas where the diameter has been enlarged by effects of insects, mistletoe, disease, physical injury, or the accumulation of moss.

21. MOSS_ABUN_CD_PNWRS

Moss abundance on limbs. The percentage of the surface area on the horizontal surface or top of each limb covered by moss. Other epiphytes, such as lichens are not included. Moss coverage was estimated from the same point used to estimate Platform Abundance, where the horizontal surface of all visible limbs in the lower two thirds of the live tree crown were evaluated. The percent cover of moss on the top of each limb was averaged across ALL limbs within the lower two thirds of the crown. Collected on all live tally trees >= 20.0 inches DBH on trees where Platform Abundance > 0; this is part of a special study and is not collected on all trees.

22. REMNANT_CD_PNWRS

Remnant code. A code indicating that the tree is a remnant from a previous stand. 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.

Code	Description
0	No, the tree is not a remnant
1	Yes , the tree is a remnant

23. TAG_NO_PNWRS Tree tag number for tally trees. Collected on all live trees that are >= 5.0 inches in DBH/DRC. Trees are marked with an aluminum tree number tag, and numbered in a clockwise order from azimuth 001 to 360, working outwards from subplot center to subplot perimeter. If a tree which requires a Tree Number has a PNW-FIA tag from a previous inventory, the old tag is reused if serviceable otherwise a new tag is attached. Tree numbers are not used more than once on the same plot.

24. STATUSCD Status code. A code indicating whether the sample tree is live, cut, or dead at the time of measurement.

Code	Description
1	Live tree
2	Dead tree

TREE_REGIONAL_BIOMASS (Tree Regional Biomass Table)

	Column Name	Descriptive Name	Data Type
1	TRE_CN	Tree sequence number	Text
2	STATECD	State code	Integer
3	REGIONAL_DRYBIOM	Regional merchantable stem biomass, ovendry weight	Real
4	REGIONAL_DRYBIOT	Regional total tree biomass, ovendry weight	Real

Important Information:
This table provides biomass estimates of live and dead trees 1 inch in diameter and larger using regionally developed equations that are generally more accurate than the equations used in the CRM procedures. Biomass estimates in this table will differ from CRM biomass estimates found on the TREE table because components such as stump, bark and top (with branches) and are derived by applying ratios to stem biomass. The TREE table will be the source of biomass data used in official reporting and national analysis. However, the TREE_REGIONAL_BIOMASS is the preferred method for PNW, to estimate biomass for western states.

1. TRE_CN — Tree sequence number. Foreign key linking a TREE_REGIONAL_BIOMASS record to either a TREE or TREE_PNW record. This TRE_CN is the same as the CN in the TREE table. To use, link TREE_REGIONAL_BIOMASS.TRE_CN = TREE.CN.

2. STATECD — States code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.

3. REGIONAL_DRYBIOM
   Regional dry merchantable stem biomass (pounds). The total gross biomass (excluding bark) of a tree 5.0 inches DBH or larger from a 1-foot stump to a minimum 4-inch top DOB of the central stem. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Calculated in oven dry pounds per tree. This field should have an entry if DIA is 5.0 inches or larger, regardless of STATUSCD or TREECLCD; zero otherwise. For dead or cut trees, this number represents the biomass at the time of death or last measurement. The column VOLCFGRS was used as the volume from which biomass was estimated.

4. REGIONAL_DRYBIOT
   Regional dry total aboveground biomass (pounds). The total aboveground biomass of a sample tree, including all tops and limbs and bark (but excluding foliage). This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Calculated in oven dry pounds per tree. This field should have an entry for live trees >= 1.0 inch DIA or dead trees >= 5 inches DIA, regardless of TREECLCD; zero otherwise. For dead or cut trees, this number represents the biomass at the time of death or last measurement.

SEEDLING (Tree Seedling Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CONDID	Condition class number	Integer
4	INVYR	Inventory year	Integer
5	STATECD	State code	Integer
6	UNITCD	Unit code	Integer
7	COUNTYCD	County code	Integer
8	PLOT	Phase 2 plot number	Integer
9	SUBP	Subplot number	Integer
10	SPCD	Species code	Integer
11	SPGRPCD	Species group code	Integer
12	STOCKING	Tree stocking	Real
13	TPA_UNADJ	Trees per acre unadjusted	Real
14	TREECOUNT_CALC	Tree count used in calculations	Integer
15	TREECOUNT_FLAG	Tree count represents 6+ seedlings	Integer
16	CYCLE	Inventory cycle number	Integer
17	SUBCYCLE	Inventory subcycle number	Integer

Seedling data collection overview - When PLOT.MANUAL < 2.0, the national core procedure was to record the actual seedling count up to six seedlings and then record 6+ if more than six seedlings were present. If PLOT.MANUAL < 2.0, then TREECOUNT_FLAG='6plus' indicating that a value of 6 in TREECOUNT_CALC actually represents 6 or more seedlings. If PLOT.MANUAL >=2.0, TREECOUNT_CALC will contain an actual count of seedlings beyond 6.

1. CN — Sequence number. A unique number used to identify a seedling record.

2. PLT_CN — Plot sequence number. Foreign key linking the seedling record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. This column is not the field plot number, P2 hex number, or P3 hex number. Link the SEEDLING table to the COND table with PLT_CN and CONDID.

3. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

4. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

7. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

8. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

9. SUBP — Subplot number. The number assigned to the subplot (1 through 4).

10. SPCD — Species code. An FIA numeric species code. Refer to appendix F for codes.

11. SPGRPCD — Species group code. A code assigned to each tree species in order to group them for reporting purposes on presentation tables. Codes and their associated names (see REF_SPECIES_GROUP.NAME) are shown in appendix G. Individual tree species and corresponding species group codes are shown in appendix F.

12. STOCKING — Tree stocking. The stocking value assigned to each count of seedlings, by species. Stocking is a relative term used to describe (in percent) the adequacy of a given stand density in meeting a specific management objective. Species or forest type stocking functions were used to assess the stocking contribution of seedling records. These functions, which were developed using stocking guides, relate the area occupied by an individual tree to the area occupied by a tree of the same size growing in a fully stocked stand of like trees. The stocking of seedling count records is used in the calculation of COND.GSSTKCD and COND.ALSTKCD on the condition record.

13. TPA_UNADJ — Trees per acre unadjusted. The number of seedlings per acre that the seedling count theoretically represents based on the sample design. For fixed radius plots taken with the mapped plot design, TPA_UNADJ equals 74.965282 times the number of seedlings counted.

14. TREECOUNT_CALC A count of the number of seedlings tallied on the microplot. The method of recording seedling counts has changed over the years. The original method was to record the actual seedling count up to six seedlings and then record 6+ if six or more seedlings were present. Later, the true count of seedlings was recorded. In the past, seedlings were often tallied in FIA inventories only to the extent necessary to determine if some minimum number were present, which means that seedlings were often under-reported. A column was created to identify when a value of 6 in TREECOUNT_CALC really represents 6 or more seedlings, rather than an exact count of 6 seedlings. When the column TREECOUNT_FLAG is equal to '6plus', this means that the value of 6 in TREECOUNT_CALC is really >= 6 seedlings.

15. TREECOUNT_FLAG Indicates that the value of '6' in the TREECOUNT_CALC column actually represents 6+ seedlings. When PLOT.MANUAL < 2.0, the national core procedure was to record the actual seedling count up to six seedlings and then record 6+ if at least six seedlings were really present. If PLOT.MANUAL < 2.0, then when TREECOUNT_FLAG='6plus' indicates that a value of 6 in TREECOUNT_CALC actually represents 6 or more seedlings. Otherwise, a value of 6 means exactly 6 seedlings were recorded. In the past, seedlings were often tallied in FIA inventories only to the extent necessary to determine if some minimum number were present, which means that seedlings were often under-reported.

16. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

17. SUBCYCLE Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

SITETREE (Site Tree Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CONDID	Condition class number	Integer
4	CONDLIST	Condition class list	Integer
5	INVYR	Inventory year	Integer
6	STATECD	State code	Integer
7	UNITCD	Survey unit code	Integer
8	COUNTYCD	County code	Integer
9	PLOT	Phase 2 plot number	Integer
10	SUBP	Subplot number	Integer
11	TREE	Tree number	Integer
12	SPCD	Species code	Integer
13	SPGRPCD	Species group code	Integer
14	AGEDIA	Tree age at diameter	Integer
15	AZIMUTH	Azimuth	Integer
16	DIST	Horizontal distance	Real
17	DIA	Diameter	Real
18	HT	Total height	Integer
19	METHOD	Site tree method code	Integer
20	SIBASE	Site index base age	Integer
21	SITREE	Site index for the tree	Integer
22	SITREE_EST	Estimated site index for the tree	Integer
23	SITE_AGE_TREE_STATUS_PNWRS	Site tree status	Text
24	SITREE_EQU_NO_PNWRS	Site tree equation number in PNW	Integer
25	SITE_TREE_METHOD_PNWRS	Site tree selection method for equations	Text
26	VALIDCD	Validity code	Integer
27	CYCLE	Inventory cycle number	Integer
28	SUBCYCLE	Inventory subcycle number	Integer

1. CN — Sequence number. A unique number used to identify a site tree record.

2. PLT_CN — Plot sequence number. Foreign key linking the site tree record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Link the SITETREE table to the COND table with PLT_CN and CONDID.

3. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

4. CONDLIST — Condition class list. A list of numbers indicating all of the condition classes for which the site index data for this tree can be used.

5. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

6. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

7. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

8. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

9. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

10. SUBP — Subplot number. The number assigned to the subplot. The national plot design has subplot number values of 1 through 4.

11. TREE — Tree number. A number used to uniquely identify a site tree on a condition.

12. SPCD — Species code. A standard tree species code. Refer to appendix F for codes.

13. SPGRPCD — Species group code. A code assigned to each tree species in order to group them for reporting purposes on presentation tables. Codes and their associated names (see REF_SPECIES_GROUP.NAME) are shown in appendix G. Individual tree species and corresponding species group codes are shown in appendix F.

14. AGEDIA — Tree age at diameter. Age (in years) of tree at the point of diameter measurement (DBH/DRC). Age is determined by an increment sample.

15. AZIMUTH — Azimuth. (*Core optional*) The direction, to the nearest degree, from subplot center to the center of the base of the tree (geographic center for multi-stemmed woodland species). Due north is represented by 360 degrees.

16. DIST — Horizontal distance. (*Core optional*) The horizontal distance in feet from subplot center (microplot center for saplings) to the pith at the base of the tree (geographic center for multi-stemmed woodland species).

17. DIA — Diameter. The current diameter (in inches) of the tree at the point of diameter measurement (DBH/DRC).

18. HT — Total height. The total length (height) of a sample tree (in feet) from the ground to the top of the main stem.

19. METHOD — Site tree method code. The method for determining the site index.

Code	Description
1	Tree measurements (length, age, etc.) collected during this inventory
2	Tree measurements (length, age, etc.) collected during a previous inventory
3	Site index estimated either in the field or office
4	Site index determined by the height intercept method during this inventory

20. SIBASE — Site index base age. The base age (sometimes called reference age), in years, of the site index curves used to derive site index. Base age is specific to a given family of site index curves, and is usually set close to the common rotation age or the age of culmination of mean annual increment for a species. The most commonly used base ages are 25, 50, 80, and 100 years. It is possible for a given species to have different sets of site index curves in different geographic regions, and each set of curves may use a different base age.

21. SITREE — Site index for the tree. Site index is calculated for dominant and co-dominant trees using one of several methods (see METHOD). It is expressed as height in feet that the tree is expected to attain at a base- or reference age (see SIBASE). Most commonly, site index is calculated using a family of curves that show site index as a function of total length and either breast- height age or total age. The height-intercept (or growth-intercept) method is commonly used for young trees or species that produce conspicuous annual branch whorls; using this method site index is calculated with the height growth attained for a short period (usually 3 to 5 years) after the tree has reached breast height. Neither age nor total length determination are necessary when using the height-intercept method, so one or more of those variables may be null for a site tree on which the height-intercept method was used.

22. SITREE_EST — Estimated site index for the tree. The estimated site index or the site index determined by the height intercept method.

23. 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,will have a status “N”.Downloaded tree records from the previous visit have status of “O”.

Code	Description
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)

24. SITREE_EQU_NO_PNWRS

Site tree equation number in PNW. Identifies which site index equation was used to calculate site index. This data item cannot be updated by the field crew. Generated for all site trees when SITE_AGE_TREE_STATUS_PNWRS = N

25. SITE_TREE_METHOD_PNWRS

Site tree selection method for equations. Identifies whether King’s and Primary, and California Mixed Conifer selection methods were used for relevant species. This item is downloaded for site trees previously collected.

26. VALIDCD

Validity code. A code indicating if this site tree provided a valid result from the site index computation. Some trees collected by the field crew yield a negative value from the equation due their age, height or diameter being outside the range of values for which the equation was developed. Computational results for trees that fail are not used to estimate the site index or site productivity class for the condition. If the site calculation for this tree was successful, this attribute is set to 1.

Code	Description
0	Tree failed in site index calculations
1	Tree was successful in site index calculations

27. CYCLE

Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

28. SUBCYCLE

Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

SURVEY (Survey Table)

	Column Name	Descriptive Name	Data type
1	CN (Primary key)	Sequence number	Text
2	INVYR	Inventory year	Integer
3	RSCD	Region or station code	Integer
4	STATECD	State code	Integer
5	STATEAB	State abbreviation	Text
6	STATENM	State name	Text
7	P3_OZONE_IND	Phase 3 ozone indicator	Text
8	NOTES	Notes	Text
9	CYCLE	Inventory cycle number	Integer
10	SUBCYCLE	Inventory subcycle number	Integer
11	ANN_INVENTORY	Annual inventory	Text

1. CN — Sequence number. A unique number used to identify a survey record.

2. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. . Under the annual inventory system, a group of plots is selected each year for sampling. The selection is based on a panel system. INVYR is the year in which the majority of plots in that group were collected (plots in the group have the same panel and, if applicable, subpanel). INVYR is not necessarily the same as MEASYEAR, which is the year when the plot was actually visited and measured.

3. RSCD — Region or Station Code. Identification number of the Forest Service Region or Station that provided the inventory data (see appendix C for more information).

Code	Description
26	Pacific Northwest Research Station (PNWRS)-CA,OR,WA
27	Pacific Northwest Research Station (PNWRS)-Alaska

4. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

5. STATEAB — State abbreviation. The two-character State abbreviation. See STATECD definition.

6. STATENM — State name. See STATECD definition.

7. P3_OZONE_IND — Phase 3 ozone indicator. Values are Y (yes) and N (no).

8. NOTES — Notes. An optional item where notes about the inventory may be stored.

9. CYCLE — Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

10. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

11. ANN_INVENTORY — Annual Inventory. An indicator to show if a particular inventory was collected as an annual inventory or a periodic inventory. Values are Y or N, and Y means that the inventory is annual. All plots in the PNW_FIADB are annual inventory plots.

DWM_COND_DWM_CALC (Condition level summary of down wood attributes)

This table contains estimates for all components of the down woody material protocol, summarized to the condition level. In most cases, users will find it easiest to use this table to estimate population totals or population means. However, all individual tables that contain raw and compiled date for each DWM component are found after this table. Use the PLOT_PNW_2010 table to select plots and expand to population estimates.

	Column Name	Descriptive Name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	CND_CN	Condition sequence number	Text
4	STRATUM_CN	Stratum sequence number	Text
5	EVALID	Evaluation identification	Integer
6	INVYR	Inventory year	Integer
7	MEASYEAR	Measurement year	Integer
8	STATECD	State code	Integer
9	UNITCD	Survey unit code	Integer
10	COUNTYCD	County code	Integer
11	PLOT	Phase 2 plot number	Integer
12	CONDID	Condition class number	Integer
13	CWD_TL_ADJ	Coarse woody debris transect length, adjusted	Real
14	CWD_LPA_ADJ	Number of coarse woody debris logs (pieces) per acre, adjusted	Real
15	CWD_DRYBIO_ADJ	Coarse woody debris biomass per acre, adjusted	Real
16	CWD_CARBON_ADJ	Coarse woody debris carbon mass per acre, adjusted	Real
17	CWD_VOLCF_ADJ	Coarse woody debris cubic foot volume per acre, adjusted	Real
18	FWD_DRYBIO_TOTAL_ADJ	Fine woody debris biomass per acre, total for all size classes, adjusted	Real
19	FWD_CARBON_TOTAL_ADJ	Fine woody debris carbon mass per acre, total for all size classes, adjusted	Real
20	FWD_VOLCF_TOTAL_ADJ	Fine woody debris cubic foot volume per acre, total for all size classes, adjusted	Real
21	FWD_SM_TL_ADJ	Small-size class fine woody debris transect length, adjusted	Real
22	FWD_SM_DRYBIO_ADJ	Small-size class fine woody debris biomass per acre, adjusted	Real
23	FWD_SM_CARBON_ADJ	Small-size class fine woody debris carbon mass per acre, adjusted	Real
24	FWD_SM_VOLCF_ADJ	Small-size class fine woody debris cubic foot volume per acre, adjusted	Real

	Column Name	Descriptive Name	Data type
25	FWD_MD_TL_ADJ	Medium-size class fine woody debris transect length, adjusted	Real
26	FWD_MD_DRYBIO_ADJ	Medium-size class fine woody debris biomass per acre, adjusted	Real
27	FWD_MD_CARBON_ADJ	Medium-size class fine woody debris carbon mass per acre, adjusted	Real
28	FWD_MD_VOLCF_ADJ	Medium-size class fine woody debris cubic foot volume per acre, adjusted	Real
29	FWD_LG_TL_ADJ	Large-size class fine woody debris transect length, adjusted	Real
30	FWD_LG_DRYBIO_ADJ	Large-size class fine woody debris biomass per acre, adjusted	Real
31	FWD_LG_CARBON_ADJ	Large-size class fine woody debris carbon mass per acre, adjusted	Real
32	FWD_LG_VOLCF_ADJ	Large-size class fine woody debris cubic foot volume per acre, adjusted	Real
33	PILE_DRYBIO_ADJ	Biomass per acre of piles, for population estimates, adjusted	Real
34	PILE_CARBON_ADJ	Carbon mass per acre of piles, for population estimates, adjusted	Real
35	PILE_VOLCF_ADJ	Cubic foot volume per acre of piles, for population estimates, adjusted	Real
36	PILE_SAMPLE_AREA_ADJ	Plot area sampled for piles, in all conditions, adjusted	Real
37	DUFF_TC_ADJ	Number of duff, litter, and fuelbed sampling points on the entire plot, adjusted	Real
38	CWD_TL_COND	Coarse woody debris transect length in the condition	Real
39	CWD_LPA_COND	Number of coarse woody debris logs (pieces) per acre in the condition	Real
40	CWD_DRYBIO_COND	Coarse woody debris biomass per acre in the condition	Real
41	CWD_CARBON_COND	Coarse woody debris carbon mass per acre in the condition	Real
42	CWD_VOLCF_COND	Coarse woody debris cubic foot volume per acre in the condition	Real
43	FWD_DRYBIO_TOTAL_COND	Fine woody debris biomass per acre, total for all size classes, in the condition	Real
44	FWD_CARBON_TOTAL_COND	Fine woody debris carbon mass per acre, total for all size classes, in the condition	Real
45	FWD_VOLCF_TOTAL_COND	Fine woody debris cubic foot volume per acre, total for all size classes, in the condition	Real
46	FWD_SM_TL_COND	Small-size class fine woody debris transect length in the condition	Real
47	FWD_SM_CNT_COND	Small-size class fine woody debris pieces count in the condition	Real
48	FWD_SM_DRYBIO_COND	Small-size class fine woody debris biomass per acre in the condition	Real

	Column Name	Descriptive Name	Data type
49	FWD_SM_CARBON_COND	Small-size class fine woody debris carbon mass per acre in the condition	Real
50	FWD_SM_VOLCF_COND	Small-size class fine woody debris cubic foot volume per acre in the condition	Real
51	FWD_MD_TL_COND	Medium-size class fine woody debris transect length in the condition	Real
52	FWD_MD_CNT_COND	Medium-size class fine woody debris pieces count in the condition	Real
53	FWD_MD_DRYBIO_COND	Medium-size class fine woody debris biomass per acre in the condition	Real
54	FWD_MD_CARBON_COND	Medium-size class fine woody debris carbon mass per acre in the condition	Real
55	FWD_MD_VOLCF_COND	Medium-size class fine woody debris cubic foot volume per acre in the condition	Real
56	FWD_LG_TL_COND	Large-size class fine woody debris transect length in the condition	Real
57	FWD_LG_CNT_COND	Large-size class fine woody debris pieces count in the condition	Real
58	FWD_LG_DRYBIO_COND	Large-size class fine woody debris biomass per acre in the condition	Real
59	FWD_LG_CARBON_COND	Large-size class fine woody debris carbon mass per acre in the condition	Real
60	FWD_LG_VOLCF_COND	Large-size class fine woody debris cubic foot volume per acre in the condition	Real
61	PILE_DRYBIO_COND	Biomass per acre of piles in the condition, for condition estimates	Real
62	PILE_CARBON_COND	Carbon mass per acre of piles in the condition, for condition estimates	Real
63	PILE_VOLCF_COND	Cubic foot volume per acre of piles in the condition	Real
64	PILE_SAMPLE_AREA_COND	Condition area sampled for piles	Real
65	DUFF_TC_COND	Number of duff, litter, and fuelbed sampling points in the condition	Real
66	CWD_TL_UNADJ	Coarse woody debris transect length, unadjusted	Real
67	CWD_LPA_UNADJ	Number of coarse woody debris logs (pieces) per acre, unadjusted	Real
68	CWD_DRYBIO_UNADJ	Coarse woody debris biomass per acre, unadjusted	Real
69	CWD_CARBON_UNADJ	Coarse woody debris carbon mass per acre, unadjusted	Real
70	CWD_VOLCF_UNADJ	Coarse woody debris cubic foot volume per acre, unadjusted	Real
71	FWD_SM_TL_UNADJ	Small-size class fine woody debris transect length, unadjusted	Real
72	FWD_SM_DRYBIO_UNADJ	Small-size class fine woody debris biomass per acre, unadjusted	Real
73	FWD_SM_CARBON_UNADJ	Small-size class fine woody debris carbon	Real

	Column Name	Descriptive Name	Data type
		mass per acre, unadjusted	
74	FWD_SM_VOLCF_UNADJ	Small-size class fine woody debris cubic foot volume per acre, unadjusted	Real
75	FWD_MD_TL_UNADJ	Medium-size class fine woody debris transect length in all conditions, unadjusted	Real
76	FWD_MD_DRYBIO_UNADJ	Medium-size class fine woody debris biomass per acre, unadjusted	Real
77	FWD_MD_CARBON_UNADJ	Medium-size class fine woody debris carbon mass per acre, unadjusted	Real
78	FWD_MD_VOLCF_UNADJ	Medium-size class fine woody debris cubic foot volume per acre, unadjusted	Real
79	FWD_LG_TL_UNADJ	Large-size class fine woody debris transect length, unadjusted	Real
80	FWD_LG_DRYBIO_UNADJ	Large-size class fine woody debris biomass per acre, unadjusted	Real
81	FWD_LG_CARBON_UNADJ	Large-size class fine woody debris carbon mass per acre, unadjusted	Real
82	FWD_LG_VOLCF_UNADJ	Large-size class fine woody debris cubic foot volume per acre, unadjusted	Real
83	PILE_DRYBIO_UNADJ	Biomass per acre of piles, for population estimates, unadjusted	Real
84	PILE_CARBON_UNADJ	Carbon mass per acre of piles, for population estimates, unadjusted	Real
85	PILE_VOLCF_UNADJ	Cubic foot volume per acre of piles, for population estimates, unadjusted	Real
86	PILE_SAMPLE_AREA_UNADJ	Plot area sampled for piles, in all conditions, unadjusted	Real
87	DUFF_TC_UNADJ	Number of duff, litter, and fuelbed sampling points on the entire plot, unadjusted	Real
88	AVG_WOOD_DENSITY	Average wood density	Real
89	FUEL_DEPTH	Average fuelbed depth in the condition	Real
90	FUEL_BIOMASS	Average fuelbed biomass per acre in the condition	Real
91	FUEL_CARBON	Average fuelbed carbon mass per acre in the condition	Real
92	DUFF_DEPTH	Average duff depth in the condition	Real
93	DUFF_BIOMASS	Average duff biomass per acre in the condition	Real
94	DUFF_CARBON	Average duff carbon per acre in the condition	Real
95	LITTER_DEPTH	Average litter depth in the condition	Real
96	LITTER_BIOMASS	Average litter biomass per acre in the condition	Real
97	LITTER_CARBON	Average litter carbon per acre in the condition	Real
98	CONDPROP_CWD	Proportion of coarse woody debris transects in the condition	Real

	Column Name	Descriptive Name	Data type
99	CONDPROP_FWD_SM	Proportion of fine woody debris transects for small-sized pieces, in the condition	Real
100	CONDPROP_FWD_MD	Proportion of fine woody debris transects for medium-sized pieces, in the condition	Real
101	CONDPROP_FWD_LG	Proportion of fine woody debris transects used to sample large-sized pieces, in the condition	Real
102	CONDPROP_DUFF	Proportion of sample points used to measure duff, litter, and fuelbed, in the condition	Real
103	CYCLE	Inventory cycle number	Integer
104	SUBCYCLE	Inventory subcycle number	Integer
105	RSCD	Region or station code	Integer
106	PHASE	Phase	Text

Note: The size classes for fine woody debris (FWD) are:

- Small-size class – pieces must be 0.01- to 0.24-inch in diameter and located on a transect segment length on the plot specified in the sample design to measure small-size FWD.
- Medium-size class – pieces must be 0.25- to 0.09-inch in diameter and located on a transect segment length on the plot specified in the sample design to measure medium-size FWD.
- Large-size class – pieces must be 1.0- to 2.9-inches in diameter and located on a transect segment length on the plot specified in the sample design to measure large-size FWD.

1. CN — Sequence number. A unique sequence number used to identify a condition down woody material calculation record in this table.
2. PLT_CN — Plot sequence number. Foreign key linking the condition down woody material calculation record to the plot record.
3. CND_CN — Condition sequence number. This is the same record CN found in the COND table.
4. STRATUM_CN — Stratum sequence number. Foreign key linking the condition down woody material calculation record to the population stratum record.
5. EVALID — Evaluation identification. The EVALID code uniquely identifies a set of field plots and associated Phase 1 summary data used to make population estimates.
6. INVYR — Inventory year. See SURVEY.INVYR description for definition.
7. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
8. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.

9. UNITCD — Unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State.

10. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.

11. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD and INVYR, PLOT may be used to uniquely identify a plot.

12. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

    A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

13. CWD_TL_ADJ — Coarse woody debris transect length, adjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design, CWD_TL_ADJ (adjusted target transect length) is the maximum length of transect line that would be installed on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, after adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the adjusted per-acre attributes of CWD, which are columns that end in "_ADJ."

14. CWD_LPA_ADJ — Number of coarse woody debris logs (pieces) per acre, adjusted. This estimate is the sum of logs per acre from all CWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. It is based on the adjusted target transect length (CWD_TL_ADJ), which is the total length of transect that could potentially be installed on the plot. This attribute is used to calculate population estimates and not to derive estimates for one condition or individual plots. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table. To expand per acre values to population totals for number of CWD logs, multiply by the acres in POP_STRATUM.EXPNS.

15. CWD_DRYBIO_ADJ Coarse woody debris biomass per acre, adjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) from all CWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum This attribute is based on the adjusted target transect length (CWD_TL_ADJ), and is used to calculate population estimates and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table. To expand per acre values to population totals for dry biomass of CWD, multiply by the acres in POP_STRATUM.EXPNS.

16. CWD_CARBON_ADJ Coarse woody debris carbon mass per acre, adjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) from all CWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum This attribute is based on the adjusted target transect length (CWD_TL_ADJ), and is used to calculate population estimates and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table. To expand per acre values to population totals for carbon mass of CWD, multiply by the acres in POP_STRATUM.EXPNS.

17. CWD_VOLCF_ADJ Coarse woody debris cubic foot volume per acre, adjusted. This estimate is the sum of gross volume per acre on a plot (in cubic feet per acre) from all CWD pieces tallied in one condition, after adjustment for partially nonsampled plots in the stratum This attribute is based on the adjusted target transect length (CWD_TL_ADJ), and is used to calculate population estimates and not to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table. To expand per acre values to population totals for gross cubic volume of CWD, multiply by the acres in POP_STRATUM.EXPNS.

18. FWD_DRYBIO_TOTAL_ADJ
Total fine woody debris biomass per acre, adjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of ALL size classes of FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_SM_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. This column is the sum of FWD_SM_DRYBIO_ADJ + FWD_MD_DRYBIO_ADJ + FWD_LG_DRYBIO_ADJ. To expand per acre values to population totals for total dry biomass of FWD, multiply by the acres in POP_STRATUM.EXPNS.

19. FWD_CARBON_TOTAL_ADJ
Total fine woody debris carbon mass per acre, adjusted. This estimate is the sum of dry carbon mass per acre (in oven-dry pounds per acre) of all-size classes of FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_SM_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. This column is the sum of FWD_SM_CARBON_ADJ + FWD_MD_CARBON_ADJ + FWD_LG_CARBON_ADJ. To expand per acre values to population totals for total dry carbon mass of FWD, multiply by the acres in POP_STRATUM.EXPNS.

20. FWD_VOLCF_TOTAL_ADJ

    Total fine woody debris volume per acre, adjusted. This estimate is the sum of volume per acre (in oven-dry pounds per acre) of ALL size classes of FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_SM_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. This column is the sum of FWD_SM_VOLCF_ADJ + FWD_MD_VOLCF_ADJ + FWD_LG_VOLCF_ADJ. To expand per acre values to population totals for total volume of FWD, multiply by the acres in POP_STRATUM.EXPNS.

21. FWD_SM_TL_ADJ Small-size class fine woody debris transect length, adjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. FWD_SM_TL_ADJ (adjusted target transect length) is the maximum length of transect line that would be installed for small-size class FWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the adjusted per-acre attributes of small-size class FWD, which are columns that end in "_ADJ."

22. FWD_SM_DRYBIO_ADJ

    Small-size class fine woody debris biomass per acre, adjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of small-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_SM_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table. To expand per acre values to population totals for dry biomass of small-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

23. FWD_SM_CARBON_ADJ

    Small-size class fine woody debris carbon mass per acre, adjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of small-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_SM_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table. To expand per acre values to population totals for carbon mass of small-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

24. FWD_SM_VOLCF_ADJ

    Small-size class fine woody debris cubic foot volume per acre, adjusted. This estimate is the sum of volume per acre (in cubic feet per acre) of small-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_SM_TL_ADJ) and is used to calculate population totals and not to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table. To expand per acre values to population totals for cubic volume of small-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

25. FWD_MD_TL_ADJ Medium-size class fine woody debris transect length, adjusted. The sum of all transect lengths (in feet)in all conditions on a plot, as specified by the sampling design. FWD_MD_TL_ADJ (adjusted target transect length) is the maximum length of transect line that would be installed for medium-size class FWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, after adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the adjusted per-acre attributes of medium-size class FWD, which are columns that end in "_ADJ."

26. FWD_MD_DRYBIO_ADJ
Medium-size class fine woody debris biomass per acre, adjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of medium-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_MD_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table. To expand per acre values to population totals for dry biomass of medium-size class FWD, multiply by the acres in POP_STRATUM.EXPNS

27. FWD_MD_CARBON_ADJ
Medium-size class fine woody debris carbon mass per acre, adjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of medium-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_MD_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table. To expand per acre values to population totals for carbon mass of medium-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

28. FWD_MD_VOLCF_ADJ
Medium-size class fine woody debris cubic foot volume per acre, adjusted. This estimate is the sum of volume per acre (in cubic feet per acre) of medium-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_MD_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table. To expand per acre values to population totals for cubic volume of medium-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

29. FWD_LG_TL_ADJ Large-size class fine woody debris transect length in all conditions, adjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. FWD_LG_TL_ADJ (adjusted target transect length) is the maximum length of transect line that could be installed for large-size class FWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, after adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the adjusted per-acre attributes of large-size class FWD, which are columns that end in "_ADJ."

30. FWD_LG_DRYBIO_ADJ

    Large-size class fine woody debris biomass per acre, adjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of large-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_LG_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table. To expand per acre values to population totals for dry biomass of large-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

31. FWD_LG_CARBON_ADJ

    Large-size class fine woody debris carbon mass per acre, adjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of large-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_LG_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table. To expand per acre values to population totals for carbon mass of large-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

32. FWD_LG_VOLCF_ADJ

    Large-size class fine woody debris cubic foot volume per acre, adjusted. This estimate is the sum of volume per acre (in cubic feet per acre) of large-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_LG_TL_ADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table. To expand per acre values to population totals for cubic volume of large-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

33. PILE_DRYBIO_ADJ Biomass per acre of piles, for population estimates, adjusted. Sum of dry biomass per acre (in oven-dry pounds per acre) of piles tallied in one condition on the plot, and adjusted for partially nonsampled plots in the stratum. This attribute has been adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table and can be used to produce population estimates for dry biomass of piles.

34. PILE_CARBON_ADJ Carbon mass per acre of piles, for population estimates, adjusted. Sum of carbon mass per acre (in pounds per acre) of piles tallied in one condition on the plot, and adjusted for partially nonsampled plots in the stratum. This attribute has been adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table before producing population estimates for carbon mass of piles.

35. PILE_VOLCF_ADJ Cubic foot volume per acre of piles, for population estimates, adjusted. Sum of the volume per acre (in cubic feet per acre) of piles tallied in one condition on the plot, and adjusted for partially nonsampled plots in the stratum. This attribute has been adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table and can be used to produce population estimates for cubic volume of piles.

36. PILE_SAMPLE_AREA_ADJ
    Plot area sampled for piles, in all conditions, adjusted. This value is the sum of the area (in acres) of all subplots or macroplots specified in the sampling design, adjusted for partially nonsampled plots in the stratum. This column has been adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table.

37. DUFF_TC_ADJ The number of duff, litter, and fuelbed sampling points on the entire plot, adjusted. Depth is measured at the 24-foot (slope distance) location on each transect. This attribute is a count of all locations measured on the plot, after adjustment for partially nonsampled plots in the stratum. It is used to estimate an average for biomass or carbon of duff, litter, or fuelbed on the plot.

38. CWD_TL_COND Coarse woody debris transect length in the condition. The sum of all transect lengths (in feet) in one condition on a plot. This total length is used to calculate per-acre estimates of volume, biomass, carbon, and number of logs for CWD in the condition. CWD attribute columns that end in "_COND" use this length in the estimation equation.

39. CWD_LPA_COND Number of coarse woody debris logs (pieces) per acre in the condition. This estimate is the sum of logs per acre from all CWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest. For example, an estimate for all forested conditions on the plot would require that CWD_LPA_COND be multiplied by CWD_TL_COND / (sum of CWD_TL_COND on forest conditions) and then summed to the plot level.

40. CWD_DRYBIO_COND
    Coarse woody debris biomass per acre in the condition. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) from all CWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest. For example, an estimate for all forested conditions on the plot would require that CWD_ DRYBIO _COND be multiplied by CWD_TL_COND / (sum of CWD_TL_COND on forest conditions) and then summed to the plot level.

41. CWD_CARBON_COND

Coarse woody debris carbon mass per acre in the condition. This estimate is the sum of carbon mass per acre (in pounds per acre) from all CWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest. For example, an estimate for all forested conditions on the plot would require that CWD_ CARBON _COND be multiplied by CWD_TL_COND / (sum of CWD_TL_COND on forest conditions) and then summed to the plot level.

42. CWD_VOLCF_COND

Coarse woody debris cubic foot volume per acre in the condition. This estimate is the sum of gross volume per acre (in cubic feet per acre) from all CWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest. For example, an estimate for all forested conditions on the plot would require that CWD_VOLCF_COND be multiplied by CWD_TL_COND / (sum of CWD_TL_COND on forest conditions) and then summed to the plot level.

43. FWD_DRYBIO_TOTAL_COND

Total fine woody debris biomass per acre, in the condition. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of ALL size classes of FWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

44. FWD_CARBON_TOTAL_COND

Total fine woody debris carbon mass per acre, in the condition. This estimate is the sum of dry carbon mass per acre (in oven-dry pounds per acre) of all-size classes of FWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

45. FWD_VOLCF_TOTAL_COND

    Total fine woody debris volume per acre, in the condition. This estimate is the sum of volume per acre (in oven-dry pounds per acre) of ALL size classes of FWD pieces tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

46. FWD_SM_TL_COND

    Small-size class fine woody debris transect length in the condition. The sum of all transect lengths (in feet) in one condition on the plot. This total length is used to calculate per-acre estimates of volume, biomass, and carbon for small-size class FWD in the condition. Attribute columns that end in "_COND" use this length in the estimation equation.

47. FWD_SM_CNT_COND

    Small-size class fine woody debris pieces count in the condition. The total number of small-size class FWD pieces on all transects in one condition on a plot.

48. FWD_SM_DRYBIO_COND

    Small-size class fine woody debris biomass per acre in the condition. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of small-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

49. FWD_SM_CARBON_COND

    Small-size class fine woody debris carbon mass per acre in the condition. This estimate is the sum of carbon mass per acre (in pounds per acre) of small-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

50. FWD_SM_VOLCF_COND

    Small-size class fine woody debris cubic foot volume per acre in the condition. This estimate is the sum of volume per acre (in cubic feet per acre) of small-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this

attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

51. FWD_MD_TL_COND

    Medium-size class fine woody debris transect length in the condition. The sum of all transect lengths (in feet) in one condition on a plot. This total length is used to calculate per-acre estimates of volume, biomass, and carbon for medium-size class FWD in the condition. Attribute columns that end in "_COND" use this length in the estimation equation.

52. FWD_MD_CNT_COND

    Medium-size class fine woody debris pieces count in the condition. The total number of medium-size class FWD pieces on all transects in one condition on a plot.

53. FWD_MD_DRYBIO_COND

    Medium-size class fine woody debris biomass per acre in the condition. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of medium-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

54. FWD_MD_CARBON_COND

    Medium- size class fine woody debris carbon mass per acre in the condition. This estimate is the sum of carbon mass per acre (in pounds per acre) of medium-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

55. FWD_MD_VOLCF_COND

    Medium-size class fine woody debris cubic foot volume per acre in the condition. This estimate is the sum of volume per acre (in cubic feet per acre) of medium-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

56. FWD_LG_TL_COND Large-size class fine woody debris transect length in the condition. The sum of all transect lengths (in feet) in one condition on a plot. This total length is used to calculate the condition-weighted per-acre estimates of volume, biomass, and carbon for large-size class FWD in the condition. Attribute columns that end in "_COND" use this length in the estimation equation.

57. FWD_LG_CNT_COND
    Large-size class fine woody debris pieces count in the condition. The total number of large-size class FWD pieces on all transects in one condition on a plot.

58. FWD_LG_DRYBIO_COND
    Large-size class fine woody debris biomass per acre in the condition. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of large-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

59. FWD_LG_CARBON_COND
    Large-size class fine woody debris carbon mass per acre in the condition. This estimate is the sum of carbon mass per acre (in pounds per acre) of large-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

60. FWD_LG_VOLCF_COND
    Large-size class fine woody debris cubic foot volume per acre in the condition. This estimate is the sum of volume per acre (in cubic feet per acre) of large-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot. Note: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

61. PILE_DRYBIO_COND
    Biomass per acre of piles in the condition, for condition estimates. The sum of dry biomass per acre (in oven-dry pounds per acre) of piles tallied in one condition on the plot, weighted by the condition proportion. This per-acre value is used when conducting a condition level analysis on individual plots and is not used to produce population estimates.

62. PILE_CARBON_COND
    Carbon mass per acre of piles in the condition, for condition estimates. The sum of carbon mass per acre (in pounds per acre) of piles tallied in one condition on the plot, weighted by the condition proportion. This per-acre value is used when conducting a condition level analysis on individual plots and is not used to produce population estimates.

63. PILE_VOLCF_COND Cubic foot volume per acre of piles in the condition. The sum of volume per acre (in cubic feet per acre) of piles in the condition. This per-acre value is used when conducting a condition level analysis on individual plots and is not used to produce population estimates.

64. PILE_SAMPLE_AREA_COND
    Condition area sampled for piles. The area (in acres) of the condition where piles are sampled. The area of the condition on each subplot or macroplot is summed across the plot.

65. DUFF_TC_COND The number of duff, litter, and fuelbed sampling points in the condition. Depth is measured at the 24-foot (slope distance) location on each transect. This attribute is a count of all locations measured within one condition, and is used to estimate an average for biomass or carbon of duff, litter, or fuelbed in one condition on the plot.

66. CWD_TL_UNADJ Coarse woody debris transect length, unadjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. CWD_TL_UNADJ (target transect length) is the maximum length of transect line that would be installed for CWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the unadjusted per-acre attributes of CWD, which are columns that end in "_UNADJ."

67. CWD_LPA_UNADJ Number of coarse woody debris logs (pieces) per acre, unadjusted. This estimate is the sum of logs per acre from all CWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. It is based on the target transect length (CWD_TL_UNADJ), which is the total length of transect that could potentially be installed on the plot. This attribute is used to calculate population estimates and not to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for number of CWD logs.

68. CWD_DRYBIO_UNADJ
    Coarse woody debris biomass per acre, unadjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) from all CWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (CWD_TL_UNADJ), and is used to calculate population estimates and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for dry biomass of CWD.

69. CWD_CARBON_UNADJ

    Coarse woody debris carbon mass per acre, unadjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) from all CWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (CWD_TL_UNADJ), and is used to calculate population estimates and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for carbon mass of CWD.

70. CWD_VOLCF_UNADJ

    Coarse woody debris cubic foot volume per acre, unadjusted. This estimate is the sum of gross volume per acre (in cubic feet per acre) from all CWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (CWD_TL_UNADJ), and is used to calculate population estimates and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for gross cubic volume of CWD.

71. FWD_SM_TL_UNADJ

    Small-size class fine woody debris transect length, unadjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. FWD_SM_TL_UNADJ (target transect length) is the maximum length of transect line that would be installed for small-size class FWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the unadjusted per-acre attributes of small-size class FWD, which are columns that end in "_UNADJ."

72. FWD_SM_DRYBIO_UNADJ

    Small-size class fine woody debris biomass per acre, unadjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of small-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_SM_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for dry biomass of small-size class FWD.

73. FWD_SM_CARBON_UNADJ

    Small-size class fine woody debris carbon mass per acre, unadjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of small-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_SM_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for carbon mass of small-size class FWD.

74. FWD_SM_VOLCF_UNADJ

    Small-size class fine woody debris cubic foot volume per acre, unadjusted. This estimate is the sum of volume per acre (in cubic feet per acre) of small-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_SM_TL_UNADJ) and is used to calculate population totals and not to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for cubic volume of small-size class FWD.

75. FWD_MD_TL_UNADJ

    Medium-size class fine woody debris transect length in all conditions, unadjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. FWD_MD_TL_UNADJ (target transect length) is the maximum length of transect line that would be installed for medium-size class FWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the unadjusted per-acre attributes of medium-size class FWD, which are columns that end in "_UNADJ."

76. FWD_MD_DRYBIO_UNADJ

    Medium-size class fine woody debris biomass per acre, unadjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of medium-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_MD_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for dry biomass of medium-size class FWD.

77. FWD_MD_CARBON_UNADJ

    Medium-size class fine woody debris carbon mass per acre, unadjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of medium-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_MD_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for carbon mass of medium-size class FWD.

78. FWD_MD_VOLCF_UNADJ

    Medium-size class fine woody debris cubic foot volume per acre, unadjusted. This estimate is the sum of volume per acre (in cubic feet per acre) of medium-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_MD_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for cubic volume of medium-size class FWD.

79. FWD_LG_TL_UNADJ

    Large-size class fine woody debris transect length, unadjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. FWD_LG_TL_UNADJ (target transect length) is the maximum length of transect line that would be installed for large-size class FWD on each subplot across all conditions (forest, nonforest, sampled, nonsampled) on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the unadjusted per-acre attributes of large-size class FWD, which are columns that end in "_UNADJ."

80. FWD_LG_DRYBIO_UNADJ

    Large-size class fine woody debris biomass per acre, unadjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of large-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_LG_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for dry biomass of large-size class FWD.

81. FWD_LG_CARBON_UNADJ

    Large-size class fine woody debris carbon mass per acre, unadjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of large-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_LG_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for carbon mass of large-size class FWD.

82. FWD_LG_VOLCF_UNADJ

    Large-size class fine woody debris cubic foot volume per acre, unadjusted. This estimate is the sum of volume per acre (in cubic feet per acre) of large-size class FWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_LG_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for cubic volume of large-size class FWD.

83. PILE_DRYBIO_UNADJ

    Biomass per acre of piles, for population estimates, unadjusted. Sum of dry biomass per acre (in oven-dry pounds per acre) of piles tallied in one condition on the plot, and unadjusted for partially nonsampled plots in the stratum. This attribute must be adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table before producing population estimates for dry biomass of piles.

84. PILE_CARBON_UNADJ

Carbon mass per acre of piles, for population estimates, unadjusted. Sum of carbon mass per acre (in pounds per acre) of piles tallied in one condition on the plot, and unadjusted for partially nonsampled plots in the stratum. This attribute must be adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table before producing population estimates for carbon mass of piles.

85. PILE_VOLCF_UNADJ

Cubic foot volume per acre of piles, for population estimates, unadjusted. Sum of the volume per acre (in cubic feet per acre) of piles tallied in one condition on the plot, and unadjusted for partially nonsampled plots in the stratum. This attribute must be adjusted by either ADJ_FACTOR_MACR or ADJ_FACTOR_SUBP stored in the POP_STRATUM table before producing population estimates for cubic volume of piles.

86. PILE_SAMPLE_AREA_UNADJ

Plot area sampled for piles, in all conditions, unadjusted. This value is the sum of the area (in acres) of all subplots or macroplots specified in the sampling design. If the macroplot was sampled (PLOT_BASIS=MACR), this value would be 1 because each macroplot is ¼ acre. If the subplot was sampled (PLOT_BASIS=SUBP) this value would be about 0.166 because each subplot is 0.0415 acres.

87. DUFF_TC_UNADJ The number of duff, litter, and fuelbed sampling points on the entire plot, unadjusted. Depth is measured at the 24-foot (slope distance) location on each transect. This attribute is a count of all locations measured on the plot, before adjustment for partially nonsampled plots in the stratum. It is used to estimate an average for biomass or carbon of duff, litter, or fuelbed on the plot.

88. AVG_WOOD_DENSITY

Average wood density. Average dry wood density in pounds per cubic foot computed by summing density of all live trees of known species weighted by cubic foot volume. This value is only used to estimate biomass of FWD where species is not recorded.

89. FUEL_DEPTH Average fuelbed depth in the condition. The average depth (in feet) of the fuelbed in the condition on the plot. Fuelbed depth extends from the start of the litter layer to the highest piece of woody debris found at the sample point. The depth is measured at the 24 foot location of each transect on the subplot. All sample depths collected in one condition are averaged. The column is null if no sample points land in the condition.

90. FUEL_BIOMASS Average fuelbed biomass per acre in the condition. The average biomass per acre (in oven-dry pounds per acre) of the fuelbed in the condition on the plot.

91. FUEL_CARBON Average fuelbed carbon mass per acre in the condition. The average carbon mass per acre (in pounds per acre) of the fuelbed in the condition on the plot.

92. DUFF_DEPTH Average duff depth in the condition. The average depth (in inches) of duff in the condition on the plot. Duff depth is measured at the 24 foot location of each transect on the subplot. All sample depths collected in one condition are averaged. The column is null if no sample points land in the condition.

93. DUFF_BIOMASS Average duff biomass per acre in the condition. The average biomass per acre (in pounds per acre) of duff in the condition on the plot.

94. DUFF_CARBON Average duff carbon per acre in the condition. The average carbon mass per acre (in pounds per acre) of duff in the condition on the plot.

95. LITTER_DEPTH Average litter depth in the condition. The average depth (in inches) of litter in the condition on the plot. Litter depth is measured at the 24 foot location of each transect on the subplot. All sample depths collected in one condition are averaged. The column is null if no sample points land in the condition.

96. LITTER_BIOMASS Average litter biomass per acre in the condition. The average biomass per acre (in oven-dry pounds per acre) of litter in the condition on the plot.

97. LITTER_CARBON Average litter carbon per acre in the condition. The average carbon mass per acre (in pounds per acre) of litter in the condition on the plot.

98. CONDPROP_CWD Proportion of coarse woody debris transects in the condition. A proportion is developed by summing the CWD transect lengths in one condition and dividing by the total unadjusted CWD transect length on the plot (CWD_TL_COND/CWD_TL_UNADJ).

99. CONDPROP_FWD_SM
Proportion of fine woody debris transects for small-sized pieces, in the condition. A proportion is developed by summing the FWD transect lengths in one condition and dividing that by the total unadjusted FWD transect length on the plot (FWD_SM_TL_COND/FWD_SM_TL_UNADJ).

100. CONDPROP_FWD_MD
Proportion of fine woody debris transects for medium-sized pieces, in the condition. A proportion is developed by summing the FWD transect lengths in one condition and dividing that by the total unadjusted FWD transect length on the plot (FWD_MD_TL_COND/FWD_MD_TL_UNADJ).

101. CONDPROP_FWD_LG
Proportion of fine woody debris transects used to sample large-sized pieces, in the condition. A proportion is developed by summing the FWD transect lengths in one condition and dividing that by the total unadjusted FWD transect length on the plot (FWD_LG_TL_COND/FWD_LG_TL_UNADJ).

102. CONDPROP_DUFF Proportion of sample points used to measure duff, litter, and fuelbed in the condition. A proportion is developed by summing the number of sample points in one condition and dividing that by the total number of points on the plot (DUFF_TC_COND/DUFF_TC_UNADJ).

103. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

104. SUBCYCLE Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured.

Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

105. RSCD

Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) .

Code	Description
26	Pacific Northwest Research Station (PNWRS)

106. PHASE

Phase. This code is used by the PNWRS to indicate the plot design for DWM measurements.

Code	Description
P2	A phase 2 plot design
P3	A phase 3 plot design
P23	A phase 2 and phase 3 plot (both designs co-located)

DWM_TRANSECT_SEGMENT table (Sampling transect segment descriptions for CWD)

	Column Name	Descriptive Name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	TRANSECT	Transect code	Integer
10	SEGMNT	Segment number	Integer
11	CONDID	Condition class number	Integer
12	HORIZ_LENGTH	Horizontal length	Real
13	HORIZ_BEGNDIST	Beginning horizontal distance of the transect segment	Real
14	HORIZ_ENDDIST	Ending horizontal distance of the transect segment	Real
15	SLOPE_BEGNDIST	Beginning slope distance	Real
16	SLOPE_ENDDIST	Ending slope distance	Real
17	SLOPE	Percent slope	Integer

1. CN — Sequence number. A unique sequence number used to identify a down woody material transect segment record.
2. PLT_CN — Plot sequence number. Foreign key linking the down woody material transect segment record to the plot record.
3. INVYR — Inventory year. See SURVEY.INVYR description for definition.
4. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.
6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.

7. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

8. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 12).

9. TRANSECT — Transect code. A code indicating the transect on which coarse woody debris was measured. Each code represents the azimuth of the transect line, extending out from subplot center.

Code	Transect
030	Transect extends 30 degrees from subplot center
150	Transect extends 150 degrees from subplot center
270	Transect extends 270 degrees from subplot center

10. SEGMNT — Segment number. A number identifying a segment on the transect within one condition, recorded sequentially from subplot center out to the end of the transect. Each condition is given a segment number as it is encountered and mapped along the transect. A segment is a continuous length of line within one condition. Segment number 8 is an office generated segment, indicating field crews did not actually measure or install the segment. Most often, this is for entire subplots that are nonsampled nonforest land

11. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

    A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

12. HORIZ_LENGTH — Horizontal length. The horizontal length of the individual transect segment in feet.

13. HORIZ_BEGNDIST — Beginning horizontal distance of a coarse woody debris transect segment. The location on the transect where the segment begins in horizontal distance, in feet. A segment is a continuous length of line within one condition. The beginning distance is the point on the transect line where the condition class changes and a new segment begins. If the beginning distance is zero, this is the start of the transect at subplot center. Each segment has a beginning and ending distance recorded as slope distance in the field, which is then converted to horizontal distance.

14. HORIZ_ENDDIST Ending horizontal distance of a coarse woody debirs transect segment. The location on the transect where the segment ends in horizontal distance, in feet. A segment is a continuous length of line within one condition. The ending distance is the point on the transect line where the condition class of the current segment changes, or the point where the transect ends on the subplot. Each segment has a beginning and ending distance recorded as slope distance in the field, which is then converted to horizontal distance.

15. SLOPE_BEGNDIST Beginning slope distance. The location along the CWD transect where the transect begins, as slope distance in feet. A segment is a continuous length of line within one condition. The beginning distance is the point on the transect line where the condition class changes and a new segment begins. If the beginning distance is zero, this is the start of the transect at subplot center. Each segment has a beginning and ending distance recorded as slope distance in the field, measured from the subplot center.

16. SLOPE_ENDDIST Ending slope distance. The location along the CWD transect where the segment ends, as slope distance in feet. A segment is a continuous length of line within one condition. The ending distance is the point on the transect line where the condition class of the current segment changes, or the point where the transect ends on the subplot. Each segment has a beginning and ending distance recorded as slope distance in the field.

17. SLOPE Percent slope. The average percent slope of the transect within the condition class being segmented. Slope ranges from 0 to 155 percent.

DWM_COARSE_WOODY_DEBRIS table (Data on down logs)

	Column Name	Descriptive Name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	TRANSECT	Transect	Integer
10	CONDID	Condition class number	Integer
11	CWDID	Coarse woody debris piece (log) number	Integer
12	SPCD	Species code	Integer
13	SMALLDIA	Small diameter	Integer
14	TRANSDIA	Transect diameter	Integer
15	LARGEDIA	Large diameter	Integer
16	LENGTH	Length of the piece	Integer
17	CHRCD_PNWRS	Charred by fire code	Integer
18	CWDHSTCD	Coarse woody debris history code	Integer
19	DECAYCD	Decay class code	Integer
20	HOLLOWCD	Hollow code	Text
21	HORIZ_DIST	Horizontal distance	Real
22	SLOPDIST	Slope distance	Real
23	LPA_UNADJ_RGN	Number of logs (pieces) per acre, unadjusted, regional design	Real
24	LPA_COND_RGN	Number of logs (pieces) per acre in the condition, regional design	Real
25	LPA_PLOT_RGN	Number of logs (pieces) per acre on the plot, regional design	Real
26	DRYBIO	Dry biomass of the piece	Real
27	CARBON	Carbon mass of the piece	Real
28	VOLCF	Cubic foot volume of the piece	Real

1. CN — Sequence number. A unique sequence number used to identify a down woody material coarse woody debris record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material coarse woody debris record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

4. MEASYEAR — Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.

5. STATECD — State code. Bureau of the Census, Federal Information Processing Standards (FIPS) two-digit numeric code for each State. In this database, codes 2, 6, 41 and 53 are used. Refer to appendix C.

6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.

7. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory.

8. SUBP — Subplot number. A code indicating the number assigned to the circular subplot. The national plot design has subplot number values of 1 through 4.

9. TRANSECT — Transect. A code indicating the transect on which coarse woody debris was measured. Each code represents the azimuth of the transect line, extending out from subplot center.

Code	Transect
030	Transect extends 30 degrees from subplot center
150	Transect extends 150 degrees from subplot center
270	Transect extends 270 degrees from subplot center

10. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

    A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

11. CWDID — Coarse woody debris piece (log) number. A number that uniquely identifies each piece that was tallied along one transect.

12. SPCD — Species code. Species codes are the same as those used for tree tally. If identification is not possible then an estimation is made whether it is an unknown softwood (299) or unknown hardwood (998). If the CWD piece is the woody stem of a shrub, a code of 001 is recorded.

13. SMALLDIA — Small diameter. The diameter, in inches, at the small end of the piece, or at the point where the piece tapers down to 3 inches. If the small end is splintered or decomposing, the diameter is measured at a point that best represents the overall volume of the piece.

14. TRANSDIA — Transect diameter. The diameter, in inches, at the point where the longitudinal center of the piece intersects the transect.

15. LARGEDIA — Large diameter. The diameter, in inches, at the large end of the piece, or at the point just above the root collar. If the end is splintered or decomposing, the diameter is measured at a point that best represents the overall volume of the piece.

16. LENGTH — Length of the piece. Length, in feet, of the CWD piece, measured between the small- and large-end diameters, or if the piece is decay class 5, between the physical ends of the piece.

17. CHRCD_PNWRS — Charred by fire code. A code indicating the percentage of the piece's surface that has been charred by fire.

Code	Description
0	None of the piece is charred by fire
1	Up to 1/3 of the piece is charred by fire
2	1/3 to 2/3 of the piece is charred by fire
3	2/3 or more of the piece is charred by fire

18. CWDHSTCD — Coarse woody debris history code. A code indicating whether or not the piece of CWD is on the ground as a result of harvesting operations or as a result of natural circumstances.

Code	Coarse woody debris history
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 (firewood cutting)
5	Exact Reason Unknown

19. DECAYCD — Decay class code. A code indicating the stage of decay that predominates along the recorded total length of the CWD piece. DECAYCD is used to reduce biomass based on ratios stored in the REF_SPECIES table. Note: Pieces within decay class 5 must still resemble a log; the pieces must be ≥ 5.0 inches in diameter, ≥5.0 inches from the surface of the ground, and at least 3.0 feet long.

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 its shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Throughout	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	Throughout	Branch stubs and pitch pockets have usually rotted down

20. HOLLOWCD — Hollow code. A code indicating whether or not the piece is hollow. If the piece has a cavity that extends at least 2 feet along the central longitudinal axis and the diameter of the cavity entrance is at least ¼ of the diameter at the end of the piece, it is classified as hollow.

Code	Hollow
Y	The piece is hollow
N	The piece is not hollow

21. HORIZ_DIST — Horizontal distance. The horizontal distance, in feet, between subplot center and the point where the transect intersects the longitudinal center of the CWD piece.

22. SLOPDIST — Slope distance. The slope distance, in feet, between the subplot center and the point where the transect intersects the longitudinal center of the coarse woody debris (CWD) piece.

23. LPA_UNADJ_RGN — Number of logs (pieces) per acre, unadjusted, regional design. This estimate is the number of logs per acre the individual piece represents. The estimate is based on the target transect length (DWM_COND_DWM_CALC.CWD_TL_UNADJ), which is the total length of transect that could potentially be installed on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used to calculate population estimates and not to derive estimates for one condition or individual plot. It should be summed for a condition or plot, adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table, and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for number of CWD logs in an area of interest (e.g., state). This column will be populated for all plots sampled with a regional design, where transect length and configuration differ from the core design. When regional and core designs are overlaid, those CWD pieces that fall only on the core design will have null in this field. This column is populated for RSCD=26, CA, OR, and WA.

24. LPA_COND_RGN Number of logs (pieces) per acre in the condition, regional design. This estimate is the number of logs per acre the individual piece represents on one condition on the plot. The estimate is based on the actual length of transect installed and sampled on that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot, and is not adjusted or used to develop population estimates. This column will be populated for all plots sampled with a regional design, where transect length and configuration differ from the core design. When regional and core designs are overlaid, those CWD pieces that fall only on the core design will have null in this field. This column is populated for RSCD = 26, CA, OR, and WA.

25. LPA_PLOT_RGN Number of logs (pieces) per acre on the plot, regional design. This estimate is the number of logs per acre the individual piece represents on the plot. The estimate is based on the actual length of transect installed and sampled on the plot. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual plot locations, and is not adjusted or used to develop population estimates. This column will be populated for all plots sampled with a regional design, where transect length and configuration differ from the core design. When regional and core designs are overlaid, those CWD pieces that fall only on the core design will have null in this field. This column is populated for RSCD = 26, CA, OR, and WA.

26. DRYBIO Dry biomass of the piece. The oven-dry biomass (in pounds) estimated for the CWD piece, adjusted for the degree of decomposition based on DECAYCD. Piece weight is reduced as it decomposes. This is a per piece value and must be multiplied by one of the logs per acre (LPA) to obtain per acre information.

27. CARBON Carbon mass of the piece. The oven-dry weight of carbon (in pounds) estimated for the CWD piece, adjusted for the degree of decomposition based on DECAYCD. Carbon mass of the piece is reduced as it decomposes. This is a per piece value and must be multiplied by one of the logs per acre (LPA) to obtain per acre information.

28. VOLCF Cubic-foot volume of the piece. The volume (in cubic feet) estimated for the CWD piece, based on length and either the small- and large-end diameter or just the transect diameter. This is a per piece value and must be multiplied by one of the logs per acre (LPA) to obtain per acre information.

DWM_FINE_WOODY_DEBRIS table (Fine Woody Debris)

	Column Name	Descriptive Name	Data type
1	CN	Unique record number for the DWM_FINE_WOODY_DEBRIS table	Text
2	PLT_CN	Unique record number for the plot in the PLOT table	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	TRANSECT	Transect ID on the subplot (azimuth)	Integer
10	CONDID	Condition class number	Integer
11	SMALLCT	Small-size class piece count	Integer
12	MEDIUMCT	Medium-size class piece count	Integer
13	LARGECT	Large-size class piece count	Integer
14	RSNCTCD	Reason for a high count of FWD	Integer
15	PILESCD	Pile present on FWD transect	Integer
16	SMALL_TL_UNADJ	Total target length of the small FWD transect, unadjusted	Real
17	MEDIUM_TL_UNADJ	Total target length of the medium FWD transect, unadjusted	Real
18	LARGE_TL_UNADJ	Total target length of the large FWD transect, unadjusted	Real
19	SMALL_TL_COND	Total length of the small FWD transect measured in one condition	Real
20	MEDIUM_TL_COND	Total length of the medium FWD transect measured in one condition	Real
21	LARGE_TL_COND	Total length of the large FWD transect measured in one condition	Real
22	SMALL_TL_PLOT	Total length of the small FWD transect measured on the plot	Real
23	MEDIUM_TL_PLOT	Total length of the medium FWD transect measured on the plot	Real
24	LARGE_TL_PLOT	Total length of the large FWD transect measured on the plot	Real

1. CN — Sequence number. A unique sequence number used to identify a down woody material fine woody debris record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material fine woody debris record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

4. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.

6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.

7. PLOT — Phase 2 plot number. An identifier for a plot. This number is unique within a state.

8. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design has subplot number values of 1 through 4.

9. TRANSECT — Transect ID on the subplot (azimuth). A code indicating the azimuth of the subplot transect on which the piece is sampled.

Code	Transect
030	Transect extends 30 degrees from subplot center
150	Transect extends 150 degrees from subplot center
270	Transect extends 270 degrees from subplot center

10. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

    A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

11. SMALLCT — Small-size class count. The number of pieces of 1-hr fuels counted in the small-size class (0.01- to 0.24-inch diameter) in one condition along the transect segment on the plot

specified in the sample design to measure small-size class FWD. Individual pieces are tallied up to 50, then ocularly estimated over a tally of 50.

12. MEDIUMCT — Medium-size class count. The number of pieces of 10-hr fuels counted in the medium-size class (0.25- to 0.9-inch diameter) in one condition along the transect segment on the plot specified in the sample design to measure medium-size class FWD. Individual pieces are tallied up to 50, then ocularly estimated over a tally of 50.

13. LARGECT — Large-size class count. The number of pieces of 100-hr fuels counted in the large-size class (1.0 to 2.9 inch diameter) in one condition along the transect segment on the plot specified in the sample design to measure large-size class FWD. Individual pieces are tallied up to 20, then ocularly estimated over a tally of 20.

14. RSNCTCD — Reason count code. A code indicating the reason that SMALLCT, MEDIUMCT, or LARGECT has more than 100 pieces tallied.

Code	Reason count
0	FWD is not unusually high (< 100)
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

15. PILESCD — Pile present on FWD transect. A code indicating whether a residue pile intersects the FWD transect segment. If the code is 1 (Yes), then FWD is not sampled.

Code	Piles
0	No pile is present on the transect, FWD was sampled
1	Yes, a pile is present on the transect, FWD was not sampled

16. SMALL_TL_COND — Small-size class transect length in condition. Sum of the transect segment lengths that were installed to measure small-sized FWD in one condition on the plot.

17. SMALL_TL_PLOT — Small-size class transect length on plot. Sum of the transect segment lengths that were installed to measure small-sized FWD on the plot. This total length includes all sampled conditions, excluding hazardous or access denied conditions.

18. SMALL_TL_UNADJ — Small-size class transect length on plot, unadjusted. Sum of all transect segment lengths on the plot that were specified in the sample design to measure small-sized FWD. Includes transects in all conditions, sampled and nonsampled. This value must be adjusted using POP_STRATUM.ADJ_FACTOR_FWD_SM to derive population estimates.

19. MEDIUM_TL_COND — Medium-size class transect length in condition. Sum of transect segment lengths that were installed to measure medium-sized FWD in one condition on the plot.

20. MEDIUM_TL_PLOT — Medium-size class transect length on plot. Sum of transect segment lengths that were installed to measure medium-sized FWD on the plot. This total length includes segment in all sampled conditions, excluding hazardous or access denied conditions.

21. MEDIUM_TL_UNADJ — Medium-size class transect length on plot, unadjusted. Sum of all transect segment lengths on the plot that were specified in the sample design to measure medium-sized FWD. Includes transects in all conditions, sampled and nonsampled. This value must be adjusted using POP_STRATUM.ADJ_FACTOR_FWD_SM to derive population estimates.

22. LARGE_TL_COND Large-size class transect length in condition. Sum of transect segment lengths that were installed to measure large-sized FWD in one condition on the plot.

23. LARGE_TL_PLOT Large-size class transect segment length on plot. Sum of transect segment lengths that were installed to measure large-sized FWD on the entire plot. This total length includes segments in all sampled conditions, excluding hazardous or access denied conditions.

24. LARGE_TL_UNADJ Large-size class transect length on plot, unadjusted. Sum of all transect segment lengths that were installed to measure large-sized FWD on the entire plot. Includes transects in all conditions, sampled and nonsampled. This value must be adjusted using POP_STRATUM.ADJ_FACTOR_FWD_LG to derive population estimates.

DWM_RESIDUAL_PILE table (residual woody piles)

	Column Name	Descriptive Name	Data type
1	CN	Unique record number for the DWM_RESIDUAL_PILE table	Text
2	PLT_CN	Unique record number for the plot in the PLOT table	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	PILE	Pile number within the subplot	Integer
10	CONDID	Condition class number	Integer
11	PPA_UNADJ	Piles per acre, unadjusted, for population estimates	Real
12	PPA_COND	Piles per acre, for the individual condition	Real
13	PPA_PLOT	Piles per acre, for the individual plot	Real
14	DRYBIO	Dry biomass of the pile	Real
15	CARBON	Carbon mass of the pile	Real
16	VOLCF	Cubic foot volume of the pile	Real
17	SHAPECD	Shape of the pile	Integer
18	DENSITY	Density (packing ratio of pile)	Integer
19	HEIGHT1	First height measurement	Integer
20	WIDTH1	First width measurement	Integer
21	LENGTH1	First length measurement	Integer
22	HEIGHT2	Second height measurement	Integer
23	WIDTH2	Second width measurement	Integer
24	LENGTH2	Second length measurement	Integer
25	AZIMUTH	Azimuth from subplot center to center of pile	Integer

1. CN — Sequence number. A unique sequence number used to identify a down woody material residual pile record.
2. PLT_CN — Plot sequence number. Foreign key linking the down woody material residual pile record to the P2 plot record.
3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

4. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.

6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.

7. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR,UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

8. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 12).

9. PILE — Pile number. A number that uniquely identifies each pile tallied on a subplot.

10. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

    A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

11. PPA_UNADJ — Piles per acre, unadjusted, for population estimates. The number of piles per acre that the pile represents before adjustment for partially nonsampled plots in the stratum. The estimate must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Note: A per acre estimate of the pile is calculated by multiplying PPA_UNADJ and any pile attribute of interest (e.g, DRYBIO).

12. PPA_COND — Piles per acre, unadjusted, for condition estimates. The number of piles per acre that the pile represents on one condition on the plot. This estimate is based on the condition area actually sampled on the plot, therefore excludes access denied or hazardous conditions. It is used to expand pile attributes for condition-level analyses, where it is important to have an estimate for an individual condition. This PPA is never adjusted and is not used to derive population estimates.

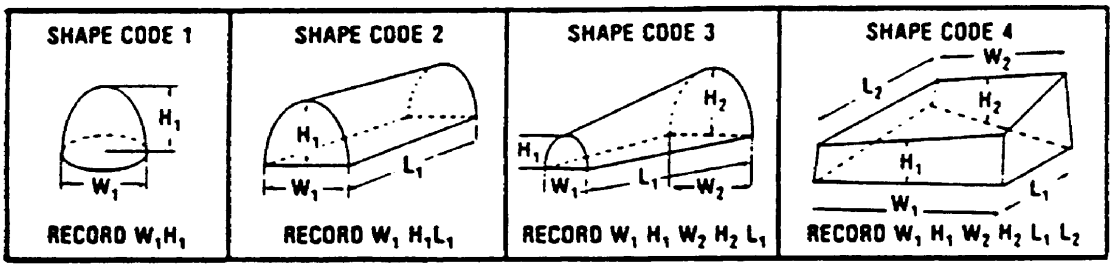
13. PPA_PLOT — Piles per acre, unadjusted, for plot estimates. The number of piles per acre that the pile represents on the individual plot. This estimate is based on the condition area actually sampled on the plot; therefore, it excludes access denied or hazardous conditions. It is used to expand pile attributes for plot-level analyses, where it is important to have an estimate for an individual plot location. This PPA is never adjusted and is not used to derive population estimates.

14. DRYBIO — Dry biomass. The oven-dry weight (in pounds) estimated for the pile. This is an individual pile value and must be multiplied by one of the piles per acre (PPA) columns to obtain per acre information.

15. CARBON — Carbon mass. The oven-dry weight of carbon (in pounds) estimated for the pile. This is an individual pile value and must be multiplied by one of the piles per acre (PPA) columns to obtain per acre information.

16. VOLCF — Gross cubic foot volume. The gross volume (in cubic feet) of the pile, calculated with equations based on shape code and pile dimensions. This is an individual pile value and must be multiplied by one of the piles per acre (PPA) columns to obtain per acre information.

17. SHAPECD — Shape code. A code indicating the shape of the pile. The type of shape is used to select an equation to estimate pile cubic volume. See figure below.



PILE SHAPE codes (Hardy 1996). Figure 14-12 from the Forest Inventory and Analysis National Core Field Guide (Phase 3, version 3.0) (see http://www.fia.fs.fed.us/library/field-guides-methods-proc/

Code	Shape
1	Paraboloids
2	Half-cylinder
3	Half-frustum of cone
4	Irregular solid

18. DENSITY — Density (packing ratio of pile). A code indicating the percent of the pile that consists of woody material ≥ 3 inches. Air, soil, rock, and live plants are not included in the estimate. Estimated to the nearest 10 percent.

Code	Density	Code	Density
00	Absent	30	21-30%
01	Trace (<1% cover)	…etc	
10	1-10%	90	81-90%
20	11-20%	99	91-100%

19. HEIGHT1 — First Height measurement. The estimated height (in feet) of either end of the pile. Pile height1 may equal pile height2. See figure under SHAPECD.

20. WIDTH1 — First Width measurement. The estimated width (in feet) of the side of HEIGHT1. Pile width1 may equal pile width2. See figure under SHAPECD.

21. LENGTH1 — First Length measurement. The estimated length (in feet) of either side of the pile. Pile length1 may equal pile length2. See figure under SHAPECD.

22. HEIGHT2 — Second Height measurement. The estimated height (in feet) of either end of the pile. Pile height1 may equal pile height2. See figure under SHAPECD.

23. WIDTH2 — Second Width measurement. The estimated width (in feet) of the side of height2. Pile width1 may equal pile width2. See figure under SHAPECD.

24. LENGTH2 — Second Length measurement. The length (in feet) of either side of the pile. Pile length1 may equal pile length2. See figure in SHAPECD.

25. AZIMUTH — Azimuth. The code indicating the azimuth from the subplot center to the pile. This azimuth centers on the pile so that it can be relocated. Use 360 for north.

DWM_DUFF_LITTER_FUEL table (Duff, Litter, and Fuelbed)

	Column Name	Descriptive Name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 public plot number	Integer
8	SUBP	Subplot number	Integer
9	TRANSECT	Transect ID on the subplot (azimuth)	Integer
10	CONDID	Condition class number	Integer
11	SMPLDCD	Sampling status for collection of duff, litter and fuelbed depths	Integer
12	SMPLOCCD	Location of duff, litter, and fuelbed samples	Integer
13	DUFFDEP	Depth of duff on one point on the transect	Real
14	LITTDEP	Depth of litter on one point on the transect	Real
15	FUELDEP	Depth of the fuelbed on one point on the transect	Real

1. CN — Sequence number. A unique sequence number used to identify a down woody material duff, litter, fuel record.
2. PLT_CN — Plot sequence number. Foreign key linking the down woody material duff, litter, fuel record to the P2 plot record.
3. INVYR — Inventory year. See SURVEY.INVYR description for definition.
4. MEASYEAR — Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.
5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.
6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.
7. PLOT — Phase 2 plot number. An identifier for a plot. PLOT number is unique within a state.
8. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design has subplot number values of 1 through 4.

9. TRANSECT — Transect. A code indicating the azimuth of the subplot transect.

Code	Transect
030	Transect extends 30 degrees from subplot center
150	Transect extends 150 degrees from subplot center
270	Transect extends 270 degrees from subplot center

10. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

11. SMPLDCD — Sampled code. A code indicating whether or not the depths of the duff, litter, and fuelbed were measured. If a log obstructed the sample location, fuelbed depth was measured but duff and litter depths were not measured. For all other obstructions (e.g., rocks), no depths were measured.

Code	Sampled
0	Partially sampled : fuelbed sampled; duff and litter depth not sampled
1	All sampled: duff, litter, and fuelbed sampled
2	Nothing sampled: duff, litter, fuelbed not sampled

12. SMPLOCCD — Sample location code. A code indicating the location along the transect where duff, litter, and fuelbed samples were taken. One transect is sampled on each subplot. Prior to 2002, there were two sample locations on the transect (at 14 and 24 feet, slope distance). Starting in 2002, there is only one sample location on the transect (at 24 feet, slope distance).

Code	Sample location
1	Duff, litter, and fuelbed sampled at 14 feet, slope distance
2	Duff, litter, and fuelbed sampled at 24 feet, slope distance

13. DUFFDEP — Duff depth. Depth of duff layer to the nearest 0.1 inch. The measurement is taken at an exact point on the 150 azimuth transect (see SMPLOCCD for location). Duff is the layer just below litter. It consists of decomposing leaves and other organic material. There are no recognizable plant parts; the duff layer is usually dark decomposed organic matter. When moss is present, the top of the duff layer is just below the green portion of the moss. The bottom of this layer is the point where mineral soil begins. To use these data, calculate an average depth for the condition.

14. LITTDEP — Litter depth. Depth of litter layer to the nearest 0.1 inch. The measurement is taken at an exact point on the 150 azimuth transect (see SMPLOCCD for location). 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. Little decomposition has begun in this layer. To use these data, calculate an average depth for the condition.

15. FUELDEP — Fuelbed depth. Depth of the fuelbed to the nearest 0.1 foot. The measurement is taken at an exact point on the 150 azimuth transect (see SMPLOCCD for location). The fuelbed is the accumulated mass of dead, woody material on the surface of the forest floor. It begins at the top of the duff layer, and includes litter, FWD, CWD, and dead woody shrubs. In this definition, the fuelbed does not include dead hanging branches from standing trees. To use these data, calculate an average depth for the condition.

DWM_MICROPLOT_FUEL (Live and dead herbs and shrubs)

	Column Name	Descriptive Name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	DHRBCD	Dead herb code--Percent cover class of dead herbs	Integer
10	DHRBHT	Dead herb height	Real
11	DSHRBCD	Dead shrub code--Percent cover class of dead shrubs	Integer
12	DSHRBHT	Dead shrub height	Real
13	LVHRBCD	Live herb code--Percent cover class of live herbs	Integer
14	LVHRBHT	Live herb height	Real
15	LVSHRBCD	Live shrub code--Percent cover class of live shrubs	Integer
16	LVSHRBHT	Live shrub height	Real
17	LITTERCD	Litter code	Real

1. CN — Sequence number. A unique sequence number used to identify a down woody material microplot fuel record.
2. PLT_CN — Plot sequence number. Foreign key linking the down woody material microplot fuel record to the P2 plot record.
3. INVYR — Inventory year. See SURVEY.INVYR description for definition.
4. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.
6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C.

7. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

8. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 12).

9. DHRBCD — Dead herb code. A cover class code indicating the percent cover of the forested microplot area covered with dead herbaceous plants and dead leaves attached to live plants if visible from above.

Code	Dead herb
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
…	
90	81-90%
99	91-100%

10. DHRBHT — Dead herb height. Indicates the height (at the tallest point) of the dead herbaceous layer to the nearest 0.1 foot. Maximum height is 6 feet.

11. DSHRBCD — Dead shrub code. A cover class code indicating the percent cover of the forested microplot area covered with dead shrubs and dead branches attached to live shrubs if visible from above.

Code	Dead shrub
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
…	
90	81-90%
99	91-100%

12. DSHRBHT — Dead shrub height. Indicates the height of the tallest dead shrub to the nearest 0.1 foot. Heights < 6 feet are measured and heights ≥ 6 feet are estimated.

13. LVHRBCD — Live herb code. A cover class code indicating the percent cover of the forested microplot area covered with live herbaceous plants.

Code	Live herb
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%

30	21-30%
…	
90	81-90%
99	91-100%

14. LVHRBHT — Live herb height. Indicates the height (at the tallest point) of the live herbaceous layer to the nearest 0.1 foot. Maximum height is 6 feet.

15. LVSHRBCD — Live shrub code. A cover class code indicating the percent cover of the forested microplot area covered with live shrubs.

Code	Live shrub
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
…	
90	81-90%
99	91-100%

16. LVSHRBHT — Live shrub height. Indicates the height of the tallest shrub to the nearest 0.1 foot. Heights < 6 feet are measured and heights ≥ 6 feet are estimated.

17. LITTERCD — Litter code. A cover class code indicating the percent cover of the forested microplot area covered with litter. Litter is the layer of freshly fallen leaves, twigs, dead moss, dead lichens, and other fine particles of organic matter found on the surface of the forest floor. Decomposition is minimal.

Code	Litter
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
…	
90	81-90%
99	91-100%

VEG_SP_PNWRS table (Understory vegetation data on each subplot)

	Column Name	Descriptive Name	Data type
1	PLT_CN	Unique record number for a plot	Text
2	INVYR	Inventory year	Integer
3	STATECD	State code	Integer
4	UNITCD	Survey unit code	Integer
5	COUNTYCD	County code	Integer
6	PLOT	Phase 2 plot number	Integer
7	SUBP	Subplot number	Integer
8	CONDID	Condition class ID	Integer
9	VEG_SPCD	Vegetation species code, final call	Text
10	UNIQUE_SP_NBR	Plant unknown species number	Integer
11	COVER_PCT	Species Cover	Integer
12	LAYER	Vegetation layer of the species	Integer
13	HT	Species Height	Integer
14	DEV_STAGE_CD	Stage of Shrub Development	Integer
15	GROWTH_HABIT_CD	Species Growth Habit	Text
16	SPCD_STATUS	Species status in a state	Text
17	SPCD_TYPE	Vegetation type code	Integer
18	SPECIMEN_LABEL_NBR	Specimen label number	Integer
19	VEG_FLDSPCD	Species recorded in the field	Text
20	VEG_TYP_CD	Vegetation type	Integer
21	VEGSP_SAMP_KIND	Vegetation sample kind	Integer
22	CYCLE	Inventory cycle number	Integer
23	SUBCYCLE	Inventory subcycle number	Integer
24	COND_STATUS_CD	Condition status code	Integer

Note: Prior to the adoption of the national core-optional P2 vegetation protocol in 2011, vegetation was measured on entire subplots if they were at least 50% forested, or on any accessible land category on National Forest lands in CA, OR, or WA. In order to combine data and facilitate analyses at the condition level, data collected prior to 2011 was split amongst the conditions on each subplot in proportion to the area of the condition class. Beginning in 2011, vegetation was only measured on forested conditions of subplots outside National Forest, and for any accessible land condition on National Forest land.

1. PLT_CN — Plot sequence number. Foreign key linking the VEG_SP_PNWRS record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number.

2. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured.

3. STATECD — State code. The numeric code that identifies a state as shown below.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

4. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

5. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

6. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

7. SUBP — Subplot number. The number assigned to the subplot. The national plot design has subplot number values of 1 through 4.

8. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

   A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

9. VEG_SPCD

Each species record has a species code recorded. Valid species codes are listed in the FIA plant guide, derived from the PLANTS database (USDA, NRCS. 2000. The PLANTS database [http://plants.usda.gov/plants]. See the REF_PLANT_DICTIONARY table for a crosswalk from code to species names. If the species of the plant cannot be identified, either the genus or an unknown generic code is recorded:

Genus list: Some plants, when not present on the Indicator or Weed lists, require identification only to the genus level.

Group	Genus	PLANT Code
Graminoids	Carex	CAREX
Graminoids	Juncus	JUNCU
Forbs	Allium	ALLIU
Forbs	Aster	ASTER
Forbs	Astragalus	ASTRA
Forbs	Castilleja	CASTI2
Forbs	Cirsium	CIRSI
Forbs	Erigeron	ERIGE2
Forbs	Lupinus	LUPIN
Forbs	Trifolium	TRIFO

10. UNIQUE_SP_NBR

Plant number for an unknown species or genus-record. A consecutive number that distinguishes unknowns or genus records when 2 or more are identified on the same plot. Note: unknown tree species is not an option (but a genus record using the correct PLANTS code is OK in rare instances).

11. COVER_PCT

The canopy cover of each species in its respective height group. Cover is estimated to the nearest 1% for each species, as the proportion of the fixed-radius plot regardless of condition class boundaries that would be obscured by all plants of the species if viewed from directly above. For each plant, cover is based on a vertically projected polygon described by the outline of the live foliage of each plant (or foliage that was live during the current growing season for senescing plants), and ignoring any normal spaces occurring between the leaves of a plant. This best reflects the plant's above- and below-ground zone of dominance.

Note that cover is always recorded as a percent of the full subplot area, even if the condition that was assessed did not cover the full subplot.

Base the percent cover estimate on the current year's growth present at the time of the plot visit. Includes both living and dead material from the current year. If herbs or shrubs have already dried out, dropped leaves, or senesced -- the cover of foliage that was live during the current growing season is estimated (e.g. on plots done early in the year, do not estimate based on the previous growing season's growth). Does not include dead branches of shrubs and trees in the cover polygons. The percent is not adjusted for the time of year during which the visit was made (i.e. if the plants are immature and small because the plot is being completed early in the growing season).
Overlap of plants of the same species is ignored. Visually group plants in a species together into a percent cover. There will often be overlap of plants of different species. Therefore, total cover for a subplot may exceed 100%. Species that are on the Indicator list or the Weed list and that cover less than 1% are recorded as 1%.

12. LAYER

Species vegetation layer. A code indicating the vertical layer in which the plant species was found. Each individual species recorded is assigned to one of the vegetation layers. These layers illustrate the vertical diversity of the predominant species found on the subplot. If a plant species in a growth habit is found in more than one layer, the entire plant is assigned to the layer where most of the cover occurs. If a species occupies multiple layers equally, the entire plant is assigned to the highest of the equally occupied layers.

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

13. HT

The entry indicates the average total height above the ground at which a species occurs, to the nearest foot. If a species occurs at substantially different heights in a subplot, plants can be grouped into two different height groups as long as the cover estimates of each are ≥ 3%. A species can be in more than one height by repeating the species code on an additional line.

Guidelines for recognizing separate heights for a species:

- Graminoid: Canopy heights must differ by at least 2 feet
- Forb: Canopy layers must differ by at least 2 feet
- Shrub: Canopy layers must differ by at least 4 feet
- Tree: Seedling layers must differ by at least 4 feet

This variable was not part of the national core-optional protocol implemented in 2011. Prior values were used to populate the LAYER variable.

14. DEV_STAGE_CD

The stage of development for each species record with a lifeform = shrub. This data was not collected after 2010.

Code	Shrub Stage of Development
1	Immature, no dead material (stems and branches) associated with the shrub record.
2	Mature, 1-24 percent dead material associated with the shrub record.
3	Over-mature, 25-49 percent dead material associated with shrub record.
4	Decadent, 50 percent or more dead material associated with shrub record.

This variable was not part of the national core-optional protocol implemented in 2011.

15. GROWTH_HABIT_CD

The growth habit code for each individual species record. Only the predominate growth habit on the subplot is recorded for the species. Species grouped into lifeforms do not get a growth habit code. Valid growth habit codes for the FIA inventory are derived from the PLANTS database (USDA, NRCS. 2000. The PLANTS database [http://plants.usda.gov/plants]. Collected on all subplots where accessible forest-land condition classes are >= 50% of the subplot.

Growth Habit Code	Description	FIA plant lifeform group	PLANTS Definition
FB	Forb/Herb	Forb	Vascular plant without significant woody tissue above or at the ground. Forbs and herbs may be annual, biennial, or perennial but always lack significant thickening by secondary woody growth and have perennating buds borne at or below the ground surface. Federal Geographic Data Committee (FGDC) definition includes graminoids, forbs, and ferns; in PLANTS, graminoids are separated.
GR	Graminoid	Graminoid	Grass or grass-like plant, including grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), arrow-grasses (Juncaginaceae), and quillworts (Isoetes). An herb in the FGDC classification.
SH	Shrub	Shrub	Perennial, multi-stemmed woody plant that is usually less than 4 to 5 meters or 13 to 16 feet in height. Shrubs typically have several stems arising from or near the ground, but may be taller than 5 meters or single-stemmed under certain environmental conditions. Includes succulents (e.g. cacti).
SS	Subshrub	Shrub or Forb	Low-growing shrub usually under 0.5 m or 1.5 feet tall (never exceeding 1 meter or 3 feet tall) at maturity. A dwarf-shrub in the FGDC classification. Includes succulents (e.g. cacti).
VI	Vine Shrub		Twining/climbing plant with relatively long stems, can be woody or herbaceous. GDC classification considers woody vines to be shrubs and herbaceous vines to be herbs.
SD	Tree seedlings		
TR	Tree	Tree or Shrub	Perennial, woody plant with a single stem (trunk), normally greater than 4 to 5 m or 13 to 16 ft in height; under certain environmental conditions, some tree species may develop a multi-stemmed or short growth form (less than 4 m or 13 ft in height).
UN	Unknown		Growth form is unknown.

16. SPCD_STATUS When any VEG_FLDSPCD is entered which is not expected in the applicable state, a code of "#" is automatically assigned. This column is an alert to users of the data.

17. SPCD_TYPE When any VEG_FLDSPCD is entered, it is automatically assigned a type, which is determined by its classification into one of three groups. This new variable was part of the national core-optional protocol implemented in 2011.

Code	Definition
G	Genus
S	Species
U	Unknown species

18. SPECIMEN_LABEL_NBR
A number assigned to a collected specimen to label it for later identification.

19. VEG_FLDSPCD The species code as recorded in the field. Valid species codes are listed in the FIA plant guide, which is derived from the PLANTS database (USDA, NRCS. 2000. The PLANTS database [http://plants.usda.gov/plants]). See the REF_PLANT_DICTIONARY table for a crosswalk from code to species names.

20. VEG_TYP_CD Vegetation type code. A determination of species lifeform, regardless of growth habit in field. This variable was not part of the national core-optional protocol implemented in 2011.

Code	Definition
1	Tree
2	Non-tree woody (shrubs+vines)
3	Forb
4	Grasses

21. VEG_SAMP_KIND Vegetation sample kind code. Indicates the reason a species was recorded and the type of sampling that occurred.

Code	Definition
1	Three most abundant species regardless of cover, or any species >3% cover. This was recorded in older data (before 2011).
5	Four most abundant species regardless of cover, or any species >3% cover. This is used on data collected in 2011 and beyond.

22. CYCLE Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

23. SUBCYCLE Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured. Subcycle 99 may be used for plots that are not included in the estimation process, or they may represent a special intensification of an area and included in the stratification.

24. COND_STATUS_CD Condition status code. A code indicating the basic land cover.
See the COND table for a description of each code.

VEG_P2VEG_SUBPLOT_SP table (Understory vegetation data on the subplot)

	Column name	Descriptive name	Data type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
5	STATECD	State code	Integer
6	UNITCD	Survey unit code	Integer
7	COUNTYCD	County code	Integer
8	PLOT	Phase 2 plot number	Number
9	SUBP	Subplot number	Number
10	CONDID	Condition class number	Integer
11	VEG_SPCD	Species	Text
12	VEG_FLDSPCD	Species recorded in the field	Text
13	UNIQUE_SP_NBR	Plant unknown species number	Integer
14	GROWTH_HABIT_CD	Growth habit code	Text
15	LAYER	Vegetation layer of the species	Integer
16	COVER_PCT	Canopy cover of each species	Integer
17	CYCLE	Inventory cycle number	Integer
18	SUBCYCLE	Inventory subcycle number	Integer

Note: Prior to the adoption of the national core-optional P2 vegetation protocol in 2011, vegetation was measured on entire subplots if they were at least 50% forested, or on any accessible land category on National Forest lands in CA, OR, or WA, and in AK in 2010. In order to combine data and facilitate analyses at the condition level, data collected prior to 2011 was split amongst the conditions on each subplot in proportion to the area of the condition class. Beginning in 2011, vegetation was only measured on forested conditions of subplots outside National Forest, and for any accessible land condition on National Forest land.

1. CN — Sequence number. A unique number used to identify the record.

2. PLT_CN — Plot sequence number. Foreign key linking the P2 Vegetation Subplot Structure record to the plot record for this location.

3. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured.

4. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

5. STATECD — State code. The numeric code that identifies a state as shown below.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix C for codes.

7. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

8. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

9. SUBP — Subplot number. The number assigned to the subplot where P2 vegetation data were collected.

10. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

    A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

11. VEG_SPCD — Vegetation species code. A code indicating each sampled vascular plant species found rooted in or overhanging the sampled condition of the subplot at any height. Species codes are the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database (currently January 2010 version).

12. VEG_FLDSPCD — Vegetation field species code. Species code assigned by the field crew, conforming to the NRCS PLANTS database as downloaded in January 2010.

13. UNIQUE_SP_NBR — Plant number for an unknown species or genus-record. A consecutive number that distinguishes unknowns or genus records when 2 or more are identified on the same

plot. Note: unknown tree species is not an option (but a genus record using the correct PLANTS code is OK in rare instances).

14. GROWTH_HABIT_CD

Growth habit code (species growth habit). A code indicating the growth habit of the species. Tally tree species are always recorded as trees, even when they exhibited a shrub-like growth habit. If a species had more than one growth habit on a condition in a subplot, the most prevalent one was recorded; however, both tree habits (SD and LT) could be coded for the same species if PLOT.LEVEL OF DETAIL=3 and the species was found in both size classes. A species may be recorded with a different growth habit on a different subplot-condition on the same plot. In the code definitions, LEVEL OF DETAIL = LOD. The P2VEG_SUBPLOT_SPP.GROWTH_HABIT_CD is not to be confused with P2VEG_SUBP_STRUCTURE.GROWTH_HABIT_CD. The codes are similar, but not exactly the same.

Code	Definition
FB	Forbs: Herbaceous, broad-leaved plants
GR	Graminoids
SD	Seedlings and Saplings
SH	Shrubs/Subshrubs/Woody Vines
LT	Large trees

Code **Description**

SD Seedlings and Saplings: Small trees less than 5 inches DBH or DRC (refer to field guide sections 5.9.2 and 5.9.4), 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% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.

SH Shrubs/Subshrubs/Woody Vines: 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. 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 total aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.

FB Forbs: Herbaceous, broad-leaved plants; includes non-woody-vines, ferns (does not include mosses and cryptobiotic crusts.) Up to four species are recorded if individual species total aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.

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% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.

LT Large Trees: Large trees greater than or equal to 5 inches DBH or DRC (refer to field guide sections 5.9.2 and 5.9.4), including 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% on the subplot and within the GROWTH_HABIT_CD when LOD = 3.

15. LAYER — Layer (species vegetation layer). A code indicating the vertical layer in which the plant species was found.

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
5	Layer associated with pre-5.0 protocol

16. COVER_PCT — The cover of each species in its respective height (layer) group. For each species recorded, the canopy cover present on the subplot condition to the nearest 1 percent. Note that cover is always recorded as a percent of the full subplot area, even if the condition that was assessed did not cover the full subplot.
Cover is estimated to the nearest 1% for each species, as the proportion of the fixed-radius plot regardless of condition class boundaries that would be obscured by all plants of the species if viewed from directly above. For each plant, cover is based on a vertically projected polygon described by the outline of the live foliage of each plant (or foliage that was live during the current growing season for senescing plants), and ignoring any normal spaces occurring between the leaves of a plant. This best reflects the plant's above- and below-ground zone of dominance.
The cover estimate is based on the current year's growth present at the time of the plot visit. Includes both living and dead material from the current year. If herbs or shrubs have already dried out, dropped leaves, or senesced -- the cover of foliage that was live during the current growing season is estimated (e.g. on plots done early in the year, do not estimate based on the previous growing season's growth). Does not include dead branches of shrubs and trees in the cover polygons. The percent is not adjusted for the time of year during which the visit was made (i.e. if the plants are immature and small because the plot is being completed early in the growing season).

Overlap of plants of the same species is ignored. Plants of the same species are visually grouped together into a percent cover. There will often be overlap of plants of different species. Therefore, total cover for a subplot may exceed 100%. Species that are on the Indicator list or the Weed list and that cover less than 1% are recorded as 1%.

17. CYCLE — Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

18. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured.

VEG_P2VEG_SUBP_STRUCTURE table (Understory vegetation data on the subplot)

	Column name	Descriptive name	Data type
1	PLT_CN	Plot sequence number	Text
2	INVYR	Inventory year	Integer
4	MEASYEAR	Measurement year	Integer
3	STATECD	State code	Integer
4	UNITCD	Survey unit code	Integer
5	COUNTYCD	County code	Integer
6	PLOT	Phase 2 plot number	Number
7	SUBP	Subplot number	Number
8	CONDID	Condition class number	Integer
9	GROWTH_HABIT_CD	Growth habit code	Text
10	LAYER	Vegetation layer of the species	Integer
11	COVER_PCT	Canopy cover of each species	Integer
12	CYCLE	Inventory cycle number	Integer
13	SUBCYCLE	Inventory subcycle number	Integer
14	RGN_FLG	Regional flag information	Text
15	RGN_TYP	Regional type information	Text
16	CN_NEW	Unique record identifier for new protocol records	Text
17	COND_STATUS_CD	Condition status code	Integer

Note: Prior to the adoption of the national core-optional P2 vegetation protocol in 2011, vegetation was measured on entire subplots if they were at least 50% forested, or on any accessible land category on National Forest lands in CA, OR, or WA, and in AK in 2010. In order to combine data and facilitate analyses at the condition level, data collected prior to 2011 was split amongst the conditions on each subplot in proportion to the area of the condition class. Beginning in 2011, vegetation was only measured on forested conditions of subplots outside National Forest, and for any accessible land condition on National Forest land.

1. PLT_CN — Plot sequence number. Foreign key linking the P2 Vegetation Subplot Structure record to the plot record for this location.

2. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured.

4. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

3. STATECD — State code. The numeric code that identifies a state as shown below.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

4. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix C for codes.

5. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

6. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

7. SUBP — Subplot number. The number assigned to the subplot where P2 vegetation data were collected.

8. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

   A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

9. GROWTH_HABIT_CD

Growth habit code (vegetation structure growth habit). Vegetation structure growth habit based on species and appearance of plants on the subplot condition. If a tree species has been selected as a tally tree species by the particular FIA unit, that species is recorded as a tally tree species growth habit (TT), even if it grows as a shrub in some environments. Woody plants not on the unit's tally tree species list may have a tree growth habit in some environments, and these are recorded as non-tally tree species (NT). If the growth habit is shrub in another environment, that species is recorded as a shrub (SH). In the code definitions, level of detail = LOD.

Code	Definition
FB	Forbs: Herbaceous, broad-leaved plants
GR	Graminoids
SH	Shrubs/Subshrubs/Woody Vines
TT	Tally Tree Species
NT	Non-tally Tree Species

Code	Description
FB	Forbs: Herbaceous, broad-leaved plants; includes non-woody-vines, ferns (does not include mosses and cryptobiotic crusts). Up to four species are recorded if individual species total cover is at least 3% of the subplot area when LOD = 2 or LOD =3.
GR	Graminoids: Grasses and grass-like plants (includes rushes and sedges). Up to four species are recorded if individual species total cover is at least 3% of the subplot area when LOD = 2 or LOD =3.
SH	Shrubs/Subshrubs/Woody Vines: 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.
TT	Tally Tree Species: All core tree species and any core optional tree species selected by a particular FIA unit. 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: Tree species not on a particular FIA unit's tree tally list that are 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. Seedlings (any length, no minimum), saplings, and mature plants are included.

10. LAYER — Species vegetation layer. A code indicating the vertical layer in which the plant species was found. Each individual species recorded is assigned to one of the vegetation layers. These layers illustrate the vertical diversity of the predominant species found on the subplot. If a plant species in a growth habit is found in more than one layer, the entire plant is assigned to the layer where most of the cover occurs. If a species occupies multiple layers equally, the entire plant is assigned to the highest of the equally occupied layers.

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
5	Layer associated with pre-5.0 protocol

11. COVER_PCT — The cover of each species in its respective height group. For each species recorded, the canopy cover present on the subplot condition to the nearest 1 percent. Note that cover is always recorded as a percent of the full subplot area, even if the condition that was assessed did not cover the full subplot.
Cover is estimated to the nearest 1% for each species, as the proportion of the fixed-radius plot regardless of condition class boundaries that would be obscured by all plants of the species if viewed from directly above. For each plant, cover is based on a vertically projected polygon described by the outline of the live foliage of each plant (or foliage that was live during the current growing season for senescing plants), and ignoring any normal spaces occurring between the leaves of a plant. This best reflects the plant's above- and below-ground zone of dominance.
The cover estimate is based on the current year's growth present at the time of the plot visit. Includes both living and dead material from the current year. If herbs or shrubs have already dried out, dropped leaves, or senesced -- the cover of foliage that was live during the current growing season is estimated (e.g. on plots done early in the year, do not estimate based on the previous growing season's growth). Does not include dead branches of shrubs and trees in the cover polygons. The percent is not adjusted for the time of year during which the visit was made (i.e. if the plants are immature and small because the plot is being completed early in the growing season).

Overlap of plants of the same species is ignored. Plants of the same species are visually grouped together into a percent cover. There will often be overlap of plants of different species. Therefore, total cover for a subplot may exceed 100%. Species that are on the Indicator list or the Weed list and that cover less than 1% are recorded as 1%.

12. CYCLE — Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

13. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured.

14. RGN_FLG — Identifies whether the record is core or regional data.

15. RGN_TYP Provides information about the earlier protocol (pre-5.0).

16. CN_NEW Unique number that identifies a record in this table, if it was collected with the new protocol referred to as Version 5.0 . Older protocol records do not have a unique identifier at this time.

17. COND_STATUS_CD Condition status code. A code indicating the basic land cover of the condition. See the COND table for a description of each code.

VEG_SP_CONDSUM table (Condition level summary of understory vegetation data)

	Column Name	Descriptive Name	Data type
1	PLT_CN	Plot sequence number	Text
2	CONDID	Condition class number	Integer
3	STATECD	State code	Integer
4	INVYR	Inventory year	Integer
5	MEASYEAR	Measurement year	Integer
6	COND_STATUS_CD	Condition status code	Integer
7	GROWTH_HABIT_CD	Species Growth Habit	Text
8	VEG_SPCD	Vegetation species code	Text
9	UNIQUE_SP_NBR	Plant unknown species number	Integer
10	COVER_COND	Percent cover in the condition	Real
11	VEGSP_SAMP_KIND	Vegetation sample kind	Integer

Note: Prior to the adoption of the national core-optional P2 vegetation protocol in 2011, vegetation was measured on entire subplots if they were at least 50% forested, or on any accessible land category on National Forest lands in CA, OR, or WA, and in AK in 2010. In order to combine data and facilitate analyses at the condition level, data collected prior to 2011 was split amongst the conditions on each subplot in proportion to the area of the condition class. Beginning in 2011, vegetation was only measured on forested conditions of subplots outside National Forest, and for any accessible land condition on National Forest land.

1. PLT_CN — Plot sequence number. Foreign key linking the VEG_SP_CONDSUM record to the PLOT or COND record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Link the VEG_SP_CONDSUM table to the COND or SUBP_COND tables with PLT_CN and CONDID.

2. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated

   A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

3. STATECD State code. The numeric code that identifies a state as shown below.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

4. INVYR Inventory year. . The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured.

5. MEASYEAR Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

6. COND_STATUS_CD Condition status code. A code indicating the basic land cover. See the COND table for a description of each code.

7. GROWTH_HABIT_CD

The growth habit code each individual species record. If a species has more than one growth habit on the subplot, only the predominate growth habit on the subplot is recorded for the species. Species grouped into lifeforms do not get a growth habit code. Valid growth habit codes are from the PLANTS database (USDA, NRCS. 2000. The PLANTS database [http://plants.usda.gov/plants].Collected on all subplots where accessible forest-land condition classes are >= 50% of the subplot.

Code	Definition
AL	All vegetation
FB	Forbs: Herbaceous, broad-leaved plants
GR	Graminoids
SD	Seedlings and Saplings
SH	Shrubs/Subshrubs/Woody Vines
SL	Bare soil
TT	Tally trees
NT	No tally trees

8. VEG_SPCD — Each species record has a species code recorded. Valid species codes are listed in the FIA plant guide, derived from the PLANTS database (USDA, NRCS. 2000. The PLANTS database [http://plants.usda.gov/plants]. See the REF_PLANT_DICTIONARY table for a crosswalk from code to species names. If the species of the plant cannot be identified, either the genus or an unknown generic code is recorded:

   Genus list: Some plants, when not present on the Indicator or Weed lists, require identification only to the genus level.

Group	Genus	PLANT Code
Graminoids	Carex	CAREX
Graminoids	Juncus	JUNCU
Forbs	Allium	ALLIU
Forbs	Aster	ASTER
Forbs	Astragalus	ASTRA
Forbs	Castilleja	CASTI2
Forbs	Cirsium	CIRSI
Forbs	Erigeron	ERIGE2
Forbs	Lupinus	LUPIN
Forbs	Trifolium	TRIFO

9. UNIQUE_SP_NBR — Plant number for an unknown species or genus-record. A consecutive number that distinguishes unknowns or genus records when 2 or more are identified on the same plot. Note: unknown tree species is not an option (but a genus record using the correct PLANTS code is OK in rare instances).

10. COVER_COND — Vegetation cover on the condition. Mean percent cover of the species (VEG_SPCD) across all portions of subplots that sample the condition. See COVER in the VEG_SP_PNWRS table for more information on how cover is estimated.

11. VEG_SAMP_KIND — Vegetation sample kind code. Indicates the reason a species was recorded and the type of sampling that occurred.

Code	Definition
1	Three most abundant species regardless of cover, or any species >3% cover. This was recorded in older data (before 2011).
5	Four most abundant species regardless of cover, or any species >3% cover. This is used on data collected in 2011 and beyond.

VEG_LIFEFORM_CONDSUM table

(Condition level summary of vegetation lifeform data)

	Column Name	Descriptive Name	Data Type
1	PLT_CN	Plot Sequence number	Text
2	CONDID	Condition class number	Integer
3	STATECD	State code	Integer
4	INVYR	Inventory year	Integer
5	MEASYEAR	Measurement year	Integer
6	COND_STATUS_CD	Condition status code	Integer
7	GROWTH_HABIT_CD	Species Growth Habit	Text
8	LAYER	Vegetation layer	Text
9	COVER_COND	Percent cover in the condition	Real

Note: Prior to the adoption of the national core-optional P2 vegetation protocol in 2011, vegetation was measured on entire subplots if they were at least 50% forested, or on any accessible land category on National Forest lands in CA, OR, or WA, and in AK in 2010. In order to combine data and facilitate analyses at the condition level, data collected prior to 2011 was split amongst the conditions on each subplot in proportion to the area of the condition class. Beginning in 2011, vegetation was only measured on forested conditions of subplots outside National Forest, and for any accessible land condition on National Forest land.

1. PLT_CN — Plot sequence number. Foreign key linking the VEG_LIFEFORM_CONDSUM record to the PLOT or COND record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Link the VEG_LIFEFORM_CONDSUM table to the COND or SUBP_COND tables with PLT_CN and CONDID.

2. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated

   A condition is an area that has similar characteristics or features, such as forest land vs. non forest land; within forest land there might be a seedling stand vs. an old growth stand of trees; or within nonforest land there might be a pasture vs. a road. All of these different areas are 'mapped' by delineating boundaries around them and estimating the proportion of the plot that falls within each condition. The result is that a plot may be divided into one or more conditions, with each condition having a unique set of attributes that are either field recorded or compiled in the office. The COND table will have one record for each condition on a plot—the plot proportion of each condition is stored in the column CONDPROP_UNADJ.

3. STATECD State code. The numeric code that identifies a state as shown below.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

4. INVYR Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured.

5. MEASYEAR Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.

6. COND_STATUS_CD Condition status code. A code indicating the basic land cover. See the COND table for a description of each code.

7. GROWTH_HABIT_CD

The growth habit code each individual species record. If a species has more than one growth habit on the subplot, only the predominate growth habit on the subplot is recorded for the species. Species grouped into lifeforms do not get a growth habit code. Valid growth habit codes are from the PLANTS database (USDA, NRCS. 2000. The PLANTS database [http://plants.usda.gov/plants].Collected on all subplots where accessible forest-land condition classes are >= 50% of the subplot.

Code	Definition
AL	All vegetation
FB	Forbs: Herbaceous, broad-leaved plants
GR	Graminoids
SD	Seedlings and Saplings
SH	Shrubs/Subshrubs/Woody Vines
SL	Bare soil
TT	Tally trees
NT	No tally trees

8. LAYER Species vegetation layer. A code indicating the vertical layer in which the plant species was found. Each individual species recorded is assigned to one of the vegetation layers. These layers illustrate the vertical diversity of the predominant species found on the subplot. If a plant species in a growth habit is found in more than one layer, the entire plant is assigned to the layer where most of the cover occurs. If a species occupies multiple layers equally, the entire plant is assigned to the highest of the equally occupied layers.

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
5	Layer associated with pre-5.0 protocol

9. COVER_COND Vegetation cover on the condition. Mean percent cover of the species (VEG_SPCD) across all portions of subplots that sample the condition. See COVER in the VEG_SP_PNWRS table for more information on how cover is estimated.

POP_EVAL (Population Evaluation Table – contains EVALIDs for each state)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	EVAL_GRP_CN	Evaluation group sequence number	Text
3	EVALID	Evaluation identifier	Integer
4	EVAL_DESCR	Evaluation description	Text
5	RSCD	Region or Station code	Integer
6	STATECD	State code	Integer
7	LOCATION_NM	Location name	Text
8	REPORT_YEAR_NM	Report year name	Text
9	LAND_ONLY	Land only	Text
10	TIMBERLAND_ONLY	Timberland only	Text
11	ESTN_METHOD	Estimation method	Text
12	NOTES	Notes about the evaluation	Text

1. CN — Sequence number. A unique number used to identify an evaluation record.

2. EVAL_GRP_CN — Evaluation group sequence number. A unique number used to identify an evaluation record.

3. EVALID — Evaluation identifier. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated phase 1 summary data used to make population estimates. In PNW, most of the time EVALID's = 4,5,6,102 are used because these identify plots that were sampled. It is rare to use EVALID=1,2,3,101: these provide estimates of both sampled and nonsampled area which is not normally done.

STATE		EVALID	EVALUATION DESCRIPTION (the grey EVALID's below are used in most cases)
OR	41	**4**	Oregon: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
CA	6	**5**	California: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
WA	53	**6**	Washington: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
OR	41	**2**	Oregon: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
CA	6	**1**	California: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
WA	53	**3**	Washington: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
			The EVALID's below are used to summarize DWM
OR	41	**40110**	Oregon: 2001-2010, **Sampled** plots, annual P2 inventory, for DWM estimation
CA	6	**50110**	California: 2001-2010, **Sampled** plots, annual P2 inventory, for DWM estimation
WA	53	**60211**	Washington: 2002-2011, **Sampled** plots, annual P2 inventory, for DWM estimation

4. EVAL_DESCR Evaluation description. A description of the area being evaluated includes the State and time period of the evaluation. See the EVALID definition above for details.

5. RSCD Region or Station Code. Identification number of the Forest Service Region or Station that provided the inventory data (see appendix C for more information).

Code	Description
26	Pacific Northwest Research Station (PNWRS)-CA,OR,WA

6. STATECD State code.

7. LOCATION_NM Location name. State name as it would appear in the title of a report.

8. REPORT_YEAR_NM Report year name. The data collection years that might appear in the report title.

LOCATION_NM	REPORT_YEAR_NM
California	list of years…., see data in table
Oregon	list of years…., see data in table
Washington	list of years…., see data in table

9. LAND_ONLY Land only. A code indicating area used in stratifying evaluations. See POP_ESTN_UNIT.AREA_SOURCE for more information.

Code	Description
Y	Only census land was used in the stratification process.
N	Census land and water were used in the stratification process.

10. TIMBERLAND_ONLY
Timberland only. A code indicting if the estimate can be made for timberland or for timberland and forest land. Timberland is a subset of forest land defined as nonreserved forest land capable of producing at least 20 cubic feet of wood volume per acre per year (COND. COND_STATUS_CD = 1, COND.RESERVCD = 0, COND.SITECLCD < 7).

Code	Description
Y	Only timberland attributes can be estimated for the evaluation
N	Both timberland and forest land attributes can be estimated for the evaluation

11. ESTN_METHOD Estimation method. Describes method of estimation. Post-stratification is used in the PNW inventory.

Values
Simple random sampling
Stratified random sampling
Double sampling for stratification
Post-stratification
Subsampling units of unequal size

12. NOTES Notes. Notes should include information about the stratification method. May include citation for any publications that used the evaluation.

POP_EVAL_GRP (Population Evaluation Group Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	EVAL_GRP	Evaluation group	Integer
3	EVAL_GRP_DESCR	Evaluation group description	Text
4	RSCD	Region or Station code	Integer
5	STATECD	State code	Integer
6	NOTES	Notes about the evaluation group	Text

1. CN — Sequence number. A unique sequence number used to identify an evaluation group record. Link the population evaluation group (POP_EVAL_GRP) record to the POP_EVAL_TYP record.

2. EVAL_GRP — Evaluation group. An evaluation group identifies the evaluations that were used in producing a core set of tables. In some cases one evaluation will be used for area and volume and another evaluation for growth, removals and mortality.

3. EVAL_GRP_DESCR — Evaluation group description. Identifies the state and range of years for the inventory.

STATECD	EVAL_GRP	EVAL_GRP_DESCR
6	62013	California: 2004-2013
41	412013	Oregon: 2004-2013
53	532013	Washington: 2004-2013

4. RSCD — Region or Station Code. Identification number of the Forest Service Region or Station that provided the inventory data (see appendix C for more information).

Code	Description
26	Pacific Northwest Research Station (PNWRS)-CA,OR,WA

5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

POP_EVAL_TYP (Population Evaluation Type Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	STATECD	State code	Integer
3	EVAL_TYP	Evaluation type	Text
4	EVAL_GRP_CN	Evaluation group sequence number	Text
5	EVAL_CN	Evaluation sequence number	Text

1. CN — Sequence number. A unique number used to identify a population evaluation type record.

2. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

3. EVAL_TYP — Evaluation type. Describes the type of evaluation. Evaluation type is needed to generate summary reports for an inventory. For example, a specific evaluation is associated with the evaluation for volume (Expvol). Use this colmun to link to the REF_POP_EVAL_TYP_DESCR table.

   Evaluation Type Values
   Expall
   Expcurr
   Expvol

4. EVAL_GRP_CN — Evaluation group sequence number. Foreign key linking the population evaluation type (POP_EVAL_TYP) record to the population evaluation group (POP_EVAL_GRP) record.

5. EVAL_CN — Evaluation sequence number. Foreign key linking the population evaluation type (POP_EVAL_TYP) record to the population evaluation (POP_EVAL) record.

POP_ESTN_UNIT (Population Estimation Unit Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	EVAL_CN	Evaluation sequence number	Text
3	RSCD	Region or station code	Integer
4	STATECD	State code	Integer
5	EVALID	Evaluation identifier	Integer
6	ESTN_UNIT	Estimation unit	Integer
7	ESTN_UNIT_DESCR	Estimation unit description	Text
8	AREA_USED	Area used to calculate all expansion factors	Real
9	AREALAND_EU	Land area within the estimation unit	Real
10	AREATOT_EU	Total area within the estimation unit	Real
11	AREA_SOURCE	Area source	Text
12	P1PNTCNT_EU	Phase 1 point count for the estimation unit	Integer
13	P1SOURCE	Phase 1 source	Text

1. CN — Sequence number. A unique sequence number used to identify an estimation unit stratum record. Link the Estimation unit (POP_ ESTN_UNIT) record to the Stratum (POP_STRATUM) record.

2. EVAL_CN — Evaluation sequence number. Foreign key linking the Estimation Unit (POP_ESTN_UNIT) record to the Evaluation (POP_EVAL) record.

3. RSCD — Region or Station Code. Identification number of the Forest Service Region or Station that provided the inventory data (see appendix C for more information).

Code	Description
26	Pacific Northwest Research Station (PNWRS)-CA,OR,WA

4. STATECD — State code.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

5. EVALID — Evaluation identifier. The EVALID code uniquely identifies a set of field plots and associated phase 1 summary data used to make population estimates. See POP_EVAL table definition above, for codes.

6. ESTN_UNIT — Estimation unit. The specific geographic area that is stratified. Estimation units are often determined by a combination of geographical boundaries, sampling intensity and ownership.

7. ESTN_UNIT_DESCR Estimation unit description. A text description of the estimation unit.

8. AREA_USED Area used to calculate all expansion factors. Is equivalent to AREATOT_EU if a station estimates all area, including census water; and to AREALAND_EU if a station estimates land area only.

9. AREALAND_EU Land area within the estimation unit. The area of land in acres enclosed by the estimation unit. Census water is excluded.

10. AREATOT_EU Total area within the estimation unit. This includes land and census water enclosed by the estimation unit.

11. AREA_SOURCE Area Source. Identifies the source of the area numbers. Usually the area source is either the U.S. Census Bureau or area estimates based on pixel counts. Example values are “US CENSUS 2000” or “PIXEL COUNT”.

12. P1PNTCNT_EU Phase 1 point count for the estimation unit. For remotely sensed data this will be the total number of pixels in the estimation unit.

13. P1SOURCE Phase 1 source. Identifies the phase 1 data source used for this stratification. Examples are NLCD and AERIAL PHOTOS.

POP_EVAL_ATTRIBUTE (Population Evaluation Attribute Table)

	Column Name	Descriptive name	Data Type
1	CN	Sequence number	Text
1	EVAL_CN	Evaluation sequence number	Text
2	STATECD	State code	Integer
3	ATTRIBUTE_NBR	Attribute number	Integer

1. CN Sequence number. A unique sequence number used to identify a Population Evaluation Attribute record

2. EVAL_CN Evaluation sequence number. Foreign key linking the population evaluation attribute (POP_EVAL_ATTRIBUTE) record to the population evaluation (POP_EVAL) record.

3. STATECD State code.

4. ATTRIBUTE_NBR Attribute number. Foreign key linking the population evaluation attribute record to the reference population attribute record.

POP_PLOT_STRATUM_ASSGN (Plot Stratum Assignment Table for the population)

This table links each plot to one or more strata within an EVALD.

	Colum Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	STRATUM_CN	Stratum sequence number	Text
4	EVALID	Evaluation identifier	Integer
5	ESTN_UNIT	Estimation unit	Integer
6	STRATUMCD	Stratum code	Integer
7	INVYR	Inventory year	Integer
8	STATECD	State code	Integer
9	UNITCD	Survey unit code	Integer
10	COUNTYCD	County code	Integer
11	PLOT	Phase 2 plot number	Integer
12	RSCD	Region or Station code	Integer

1. CN — Sequence number. A unique number used to identify a population plot stratum assignment record.

2. PLT_CN — Plot sequence number. Foreign key linking the population plot stratum assignment record to the plot record. A unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number.
Link the POP_PLOT_STRATUM_ASSGN to PLOT with PLT_CN, and the POP_PLOT_STRATUM_ASSGN to POP_STRATUM with STRATUM_CN.

3. STRATUM_CN — Stratum sequence number. Foreign key linking the Plot Stratum Assignment record (POP_PLOT_STRATUM_ASSGN) to the stratum record(POP_ STRATUM).
POP_PLOT_STRATUM_ASSGN.STRATUM_CN = POP_STRATUM.CN

4. EVALID — Evaluation identifier. The EVALID code uniquely identifies a set of field plots and associated phase 1 summary data used to make population estimates.

STATE		EVALID	EVALUATION DESCRIPTION (the grey EVALID's below are used in most cases)
OR	41	**4**	Oregon: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
CA	6	**5**	California: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
WA	53	**6**	Washington: Most recent 10 years, **Sampled** plots, includes R6 intensified grid plots
OR	41	**2**	Oregon: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
CA	6	**1**	California: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
WA	53	**3**	Washington: Most recent 10 years, **All** plots, includes Access-denied, Hazardous plots
			The EVALID's below are used to summarize DWM
OR	41	**40110**	Oregon: 2001-2010, **Sampled** plots, annual P2 inventory, for DWM estimation
CA	6	**50110**	California: 2001-2010, **Sampled** plots, annual P2 inventory, for DWM estimation
WA	53	**60211**	Washington: 2002-2011, **Sampled** plots, annual P2 inventory, for DWM estimation

5. ESTN_UNIT — Estimation unit. A geographic area upon which stratification is performed. Sampling intensity must be uniform within an estimation unit. There are usually multiple estimation units within an Evalid.

6. STRATUMCD — Stratum code. The code used for a particular stratum, which is unique within an RSCD, EVALID, ESTN_UNIT.

7. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured.

8. STATECD — State code.

9. UNITCD — Survey unit code. Refer to appendix C for codes.

10. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State.

11. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory.

12. RSCD — Region or Station Code

26	Pacific Northwest Research Station (PNWRS)-CA,OR,WA

POP_STRATUM table (Describes strata in the population)

Note: The expansion factors and adjustment factors have been stored on the PLOT_PNW table for ease of use. See PLOT_PNW for more information.

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	ESTN_UNIT_CN	Estimation unit sequence number	Text
3	STATECD	State code	Integer
4	EVALID	Evaluation identifier	Integer
5	ESTN_UNIT	Estimation unit	Integer
6	STRATUMCD	Stratum code	Integer
7	STRATUM_DESCR	Stratum description	Text
8	EXPNS	Expansion factor	Integer
9	ADJ_FACTOR_MACR	Adjustment factor for the macroplot	Real
10	ADJ_FACTOR_SUBP	Adjustment factor for the subplot	Real
11	ADJ_FACTOR_MICR	Adjustment factor for the microplot	Real
12	ADJ_FACTOR_CWD	Adjustment factor for CWD estimates	Real
13	ADJ_FACTOR_FWD_SM	Adjustment factor for small and medium sized FWD estimates	Real
14	ADJ_FACTOR_FWD_LG	Adjustment factor for large sized FWD estimates	Real
15	ADJ_FACTOR_DUFF	Adjustment factor for Duff estimates	Real
16	P1POINTCNT	Phase 1 point count	Integer
17	P2POINTCNT	Phase 2 point count	Integer
18	RSCD	Region or Station code	Integer

1. CN — Sequence number. A unique number used to identify a stratum record. Link a POP_STRATUM record to a POP_PLOT_STRATUM_ASSGN record with this CN.

2. ESTN_UNIT_CN — Estimation unit sequence number. Foreign key linking the stratum (POP_STRATUM) record to the estimation unit (POP_ESTN_UNIT) record.

3. STATECD — State code.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

4. EVALID — Evaluation identifier. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated phase 1 summary data used to make population estimates.

5. ESTN_UNIT — Estimation unit. The particular geographic area for which a particular computation applies. Estimation units are determined by a combination of sampling intensity and geographical boundaries.

6. STRATUMCD — Stratum code. A number used to uniquely identify a stratum within an estimation unit.

7. STRATUM_DESCR — Stratum description. Stratum are usually based on land use (e.g., forest or nonforest) but may also be based on other criteria such as ownership (e.g., private/public/ national forest).

8. EXPNS — Expansion factor. The area, in acres, that a stratum represents divided by the number of sampled plots in that stratum. This attribute can be used to obtain estimates of population area when summed across all the plots in the population of interest. These acres differ by Evalid and stratum. The EXPNS is converted to EXPCURR and EXPVOL in the PLOT_PNW table, to simplify expansion when running queries.

9. ADJ_FACTOR_MACR — Adjustment factor for the macroplot. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions). It is used with condition proportion (COND.CONDPROP_UNADJ) and area expansion (EXPNS) to provide area estimates. ADJ_FACTOR_MACR is also used with EXPNS and the unadjusted trees per acre (TREE.TPA_UNADJ) to provide tree estimates for sampled land. If a macroplot was not installed, this attribute is left blank (null). Refer to chapter 4 for examples. See PLOT_PNW definitions for more information.

10. ADJ_FACTOR_SUBP — Adjustment factor for the subplot. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions). It is used with condition proportion (COND.CONDPROP_UNADJ) and area expansion (EXPNS) to provide area estimates. ADJ_FACTOR_SUBP is also used with EXPNS and unadjusted trees per acre (TREE.TPA_UNADJ) to provide tree estimates for sampled land. Refer to chapter 4 for examples. See PLOT_PNW definitions for more information.

11. ADJ_FACTOR_MICR — Adjustment factor for the microplot. A value that adjusts population estimates to account for partially nonsampled plots (access denied and hazardous portions). It is used with POP_STRATUM.EXPNS and the unadjusted seedlings per acre (SEEDLING.TPA_UNADJ) or unadjusted saplings per acre (TREE.TPA_UNADJ where DIA < 5.0) to provide tree estimates for sampled land. Refer to chapter 4 for examples.

12. ADJ_FACTOR_CWD Adjustment factor for CWD estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. The factor is a ratio of CWD transect length that was sampled vs. the total transect length as defined in the sampling design. This adjustment factor should be applied to the various unadjusted columns in the DWM_COND_DWM_CALC and DWM_COARSE_WOODY_DEBRIS tables when generating population estimates for CWD attributes (i.e. volume, biomass, carbon, number of logs).

13. ADJ_FACTOR_FWD_SM
    Adjustment factor for small and medium FWD estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. The factor is a ratio of FWD transect length that was sampled vs. the total transect length as defined in the sampling design This adjustment factor should be applied to the various unadjusted columns in the DWM_COND_DWM_CALC and DWM_FINE_WOODY_DEBRIS tables when generating population estimates for small and medium FWD attributes (i.e. volume, biomass, carbon).

14. ADJ_FACTOR_FWD_LG
    Adjustment factor for large FWD estimates. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions) in the stratum where the plot is located. The factor is a ratio of FWD transect length that was sampled vs. the total transect length as defined in the sampling design This adjustment factor should be applied to the various unadjusted columns in the DWM_COND_DWM_CALC and DWM_FINE_WOODY_DEBRIS tables when generating population estimates for large FWD attributes (i.e. volume, biomass, carbon).

15. ADJ_FACTOR_DUFF
    Adjustment factor for duff. Ratio of points that were sampled for duff and litter to target number of points for all partially and fully sampled plots in stratum.

16. P1POINTCNT Phase 1 point count. For remotely sensed data this will be the number of pixels in the stratum.

17. P2POINTCNT Phase 2 point count. The number of field plots that are within the stratum.

18. RSCD Region or Station Code. Identification number of the Forest Service Region or Station that provided the inventory data (see appendix C for more information).

Code	**Description**
26	Pacific Northwest Research Station (PNWRS)-CA,OR,WA

REF_SPECIES table (Reference species code to name crosswalk table)

	Column Name	Descriptive Name	Data Type
1	SWHW	Softwood or hardwood species	Text
2	SPCD (Primary key)	Species code	Integer
3	COMMON_NAME	Common name of species	Text
4	SPECIES_SYMBOL	Species symbol	Text
5	SFTWD_HRDWD	Softwood or hardwood spp	Text
6	WOODLAND	Woodland species (diameter measured at DRC)	Text
7	W_SPGRPCD	Western species group code	Integer
8	GENUS	Genus	Text
9	SPECIES	Species name	Text
10	VARIETY	Variety	Text
11	SUBSPECIES	Subspecies name	Text
12	WEST	Western species	Text
13	EXISTS_IN_PNWRS	Exists in the PNW Research Station	Text
14	MAJOR_SPGRPCD	Major species group code	Integer
15	STOCKING_SPGRPCD	Stocking species group code, used for compilation	Integer
16	FOREST_TYPE_SPGRPCD	Forest type species group code, used for compilation	Integer
17	SITETREE	Site tree	Text
18	ST_EXISTS_IN_PNWRS	Site tree exists in the PNW Research Station	Text
19	BARK_VOL_PCT	Bark volume as a percent of wood volume	Real
20	BARK_VOL_PCT_CIT	Citation for the percent bark volume factor	Integer
21	BARK_SPGR_GREENVOL_DRYWT	Specific gravity for bark (uses green volume to produce ovendry weight)	Real
22	BARK_SPGR_GREENVOL_DRYWT_CIT	Specific gravity for bark citation	Integer
23	CORE	A core species, therefore measured	Text
24	CWD_DECAY_RATIO1	Coarse woody debris decay ratio for decay class 1	Real
25	CWD_DECAY_RATIO2	Coarse woody debris decay ratio for decay class 2	Real
26	CWD_DECAY_RATIO3	Coarse woody debris decay ratio for decay class 3	Real
27	CWD_DECAY_RATIO4	Coarse woody debris decay ratio for decay class 4	Real
28	CWD_DECAY_RATIO5	Coarse woody debris decay ratio for decay class 5	Real
29	DWM_CARBON_RATIO	Down woody debris carbon ratio	Real
30	JENKINS_SPGRPCD	Jenkins species group code	Real
31	JENKINS_TOTAL_B1	Jenkins total biomass B1 coefficient in the equation	Real
32	JENKINS_TOTAL_B2	Jenkins total biomass B2 coefficient in the equation	Real
33	JENKINS_STEM_WOOD_RATIO_B1	Jenkins stem wood ratio B1 coefficient in the equation	Real

	Column Name	Descriptive Name	Data Type
34	JENKINS_STEM_WOOD_RATIO_B2	Jenkins stem wood ratio B2 coefficient in the equation	Real
35	JENKINS_STEM_BARK_RATIO_B1	Jenkins stem bark ratio B1 coefficient in the equation	Real
36	JENKINS_STEM_BARK_RATIO_B2	Jenkins stem bark ratio B2 coefficient in the equation	Real
37	JENKINS_FOLIAGE_RATIO_B1	Jenkins foliage ratio B1 coefficient in the equation	Real
38	JENKINS_FOLIAGE_RATIO_B2	Jenkins foliage ratio B2 coefficient in the equation	Real
39	JENKINS_ROOT_RATIO_B1	Jenkins root ratio B1 coefficient in the equation	Real
40	JENKINS_ROOT_RATIO_B2	Jenkins root ratio B2 coefficient in the equation	Real
41	JENKINS_SAPLING_ADJUSTMENT	Jenkins sapling adjustment factor	Real
42	MC_PCT_GREEN_WOOD	Moisture content of green wood as a percent of ovendry weight	Real
43	MC_PCT_GREEN_WOOD_CIT	Moisture content of green wood citation	Integer
44	MC_PCT_GREEN_BARK	Moisture content of green bark as a percent of ovendry weight	Real
45	MC_PCT_GREEN_BARK_CIT	Moisture content of green bark citation	Integer
46	RAILE_STUMP_DOB_B1	Raile stump diameter outside bark, B1 coefficient in the equation	Real
47	RAILE_STUMP_DIB_B1	Raile stump diameter inside bark , B1 coefficient in the equation	Real
48	RAILE_STUMP_DIB_B2	Raile stump diameter inside bark , B2 coefficient in the equation	Real
49	STANDING_DEAD_DECAY_RATIO1	Standing dead (snag) decay ratio for decay class 1	Real
50	STANDING_DEAD_DECAY_RATIO2	Standing dead (snag) decay ratio for decay class 2	Real
51	STANDING_DEAD_DECAY_RATIO3	Standing dead (snag) decay ratio for decay class 3	Real
52	STANDING_DEAD_DECAY_RATIO4	Standing dead (snag) decay ratio for decay class 4	Real
53	STANDING_DEAD_DECAY_RATIO5	Standing dead (snag) decay ratio for decay class 5	Real
54	WOOD_SPGR_GREENVOL_DRYWT	Specific gravity for wood (uses green volume to produce ovendry weight)	Real
55	WOOD_SPGR_GREENVOL_DRYWT_CIT	Sspecific gravity for wood citation	Integer
56	WOOD_SPGR_MC12VOL_DRYWT	Wood specific gravity for wood with 12 % moisture content	Real
57	WOOD_SPGR_MC12VOL_DRYWT_CIT	Wood specific gravity citation	Integer

Note: Coefficients for calculating total aboveground biomass based on Jenkins and others (2003) equations are included in the REF_SPECIES table. Coefficients for calculating biomass components (stem wood, stem bark, foliage, coarse roots, stump, and sapling) are also included in the REF_SPECIES table. Biomass in branches and treetops (tops and limbs) may be found by subtracting the biomass in stem wood, stem bark, foliage, and stump from total aboveground biomass. An overview of the approach of the new biomass equations can be found in Heath and others (2009). Appendix J provides detailed descriptions of component ratio method equations.

1. SWHW — Softwood/ hardwood group. Indicates whether the species is a softwood or a hardwood. This column is used in queries to group and order tree records and display results. Sort by SWHW and then by SPCD for an organized display.

2. SPCD — Species code. A numeric FIA tree species code. Refer to appendix F for codes. Link to any table that contains SPCD to crosswalk to the common name for the species.

3. COMMON_NAME — Common name of the species. Refer to appendix F.

4. SPECIES_SYMBOL — Species symbol. The NRCS PLANTS database code associated with the FIA tree species code.

5. SFTWD_HRDWD — Softwood/ hardwood. Indicates whether the species is a softwood or a hardwood. Softwoods are marked with an S and hardwoods with an H.

6. WOODLAND — Woodland. Indicates if the species is classified as a woodland species, meaning that the diameter is measured as root collar. Woodland species are marked with an X.

7. W_SPGRPCD — Western species group code. A code indicating the FIADB species group assignment for western species. Depending on the State in which a tree is tallied, either the eastern or western species group code is associated with the actual TREE, SITE_TREE, and SEEDLING data. Species group codes and names can be found in appendix F.

8. GENUS — Genus. The genus name associated with the FIA tree species code. Refer to App F.

9. SPECIES — Species. The species name associated with the FIA tree species code. See App F.

10. VARIETY — Variety. The variety name associated with the FIA tree species code.

11. SUBSPECIES — Subspecies. The subspecies name associated with the FIA tree species code.

12. WEST — West. Indicates if the species can occur in the Western United States. Valid western species are marked with a W.

13. EXISTS_IN_PNWRS — Exists in the Pacific Northwest Research Station. Indicates which species are valid for Pacific Northwest Research Station States. Tree species that are applicable to Pacific Northwest States are marked with an X.

14. MAJOR_SPGRPCD — Major species group code. A code indicating the major species group, which can be used for reporting purposes.

Code	Description
1	Pine
2	Other conifers
3	Soft hardwood
4	Hard Hardwood

15. STOCKING_SPGRPCD

Stocking species group code. A code indicating to which stocking equation a species is assigned.

Code	Description
1	Spruce-fir
2	Western larch
3	Black spruce
4	Jack pine
5	Lodgepole pine
6	Shortleaf pine
7	Slash pine
8	Western white pine
9	Longleaf pine
10	Ponderosa pine
11	Red pine
12	Pond pine
13	Eastern white pine
14	Loblolly pine
15	Douglas-fir
16	Northern white cedar
17	Eastern hemlock
18	Western hemlock
19	Redwood
20	Average Softwood
25	Red maple
26	Red alder
27	Maple, beech, birch
28	Paper birch
29	Oaks and hickory
30	Black walnut
31	Sweetgum
32	Aspen
33	Cherry, ash, yellow poplar
35	Basswood
36	Elm, ash, cottonwood
37	Average hardwood
38	Dryland species

16. FOREST_TYPE_SPGRPCD

Forest type species group code. A code indicating to which initial forest type group a species is assigned. This is needed for the forest type algorithm.

17. SITETREE — Site tree. Indicates whether the tree species can be coded as a site tree. Tree species that are applicable to have site data collected are marked with an X.

18. ST_EXISTS_IN_PNWRS

Site tree species exists in the Pacific Northwest Research Station. Indicates whether or not the species is valid for a site tree in PNW Research Station States. Tree species that are applicable to have site data collected are marked with an X.

19. BARK_VOL_PCT — Bark volume as a % of wood volume. Bark volume expressed as a percent of wood volume. The volume of bark does not include voids due to ridges and valleys in bark.

20. BARK_VOL_PCT_CIT

    Citation for BARK_VOL_PCT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the BARK_VOL_PCT variable.

21. BARK_SPGR_GREENVOL_DRYWT

    Green specific gravity of the bark (green volume and oven-dry weight). There is some shrinkage in bark volume when a live tree is cut and dried. In FIADB, this specific gravity is used on live and dead trees to convert green volume to ovendry weight in pounds. Oven-dry biomass for bark can be calculated using the volume of a tree using this equation:
    B_{odw} = BARK_VOLUME x BARK_SPGR_GREENVOL_DRYWT x 62.4

    Where: B_{odw} = oven-dry biomass of bark on a tree in pounds

    BARK_VOLUME = volume of the bark on a tree bole, in cubic feet. Note that bark volume is often estimated by subtracting volume of the bole inside bark from volume of the bole outside bark. Or, an estimate of bark volume can be obtained using any tree volume column along with BARK_VOL_PCT found in this table as follows:

    BARK_VOLUME = TREE_VOLUME * (BARK_VOL_PCT/100.0)

22. BARK_SPGR_GREENVOL_DRYWT_CIT

    Citation for BARK_SPGR_GREENVOL_DRYWT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the BARK_SPGR_GREENVOL_DRYWT variable.

23. CORE

    Core. Indicates that the tree species must be measured by all FIA work units. Species marked with a Y are core and core optional species are marked with an N.

24. CWD_DECAY_RATIO1

    Coarse woody debris decay ratio for decay class 1. Ratio of decayed to sound wood weight of CWD indicated by decay class 1.

25. CWD_DECAY_RATIO2

    Coarse woody debris decay ratio for decay class 2. Ratio of decayed to sound wood weight of CWD indicated by decay class 2.

26. CWD_DECAY_RATIO3

    Coarse woody debris decay ratio for decay class 3. Ratio of decayed to sound wood weight of CWD indicated by decay class 3.

27. CWD_DECAY_RATIO4

    Coarse woody debris decay ratio for decay class 4. Ratio of decayed to sound wood weight of CWD indicated by decay class 4.

28. CWD_DECAY_RATIO5

    Coarse woody debris decay ratio for decay class 5. Ratio of decayed to sound wood weight of CWD indicated by decay class 5.

29. DWM_CARBON_RATIO Down woody debris carbon ratio. Ratio of carbon mass to dry wood weight.

30. JENKINS_SPGRPCD Jenkins species group code. A code that identifies a group of similar species, necessary for biomass estimation with equations developed by Jenkins and others (2003). Each species group may have a specific set of biomass equation coefficients assigned to the group. The data column descriptions that follow explain how to estimate biomass and when to use a certain set of coefficients.

Jenkins species group code	Description
1	Cedar/larch
2	Douglas-fir
3	True fir/hemlock
4	Pine
5	Spruce
6	Aspen/alder/cottonwood-willow
7	Soft maple/birch
8	Mixed hardwood
9	Hard maple/oak/hickory/beech
10	Juniper/oak/mesquite

31. JENKINS_TOTAL_B1

Jenkins total B1. Jenkins B1 coefficient used to estimate total aboveground ovendry biomass (pounds). This is coefficient B_0 from table 4 in Jenkins and others (2003). See appendix J for details on biomass equations.

Use JENKINS_TOTAL_B1 along with JENKINS_TOTAL_B2 to estimate total aboveground biomass [includes stem wood (bole), stump, bark, top, limbs, and foliage] with the equation below:
Total_agb = (Exp(JENKINS_TOTAL_B1 + JENKINS_TOTAL_B2 * ln(DIA*2.54)) * 2.2046)

JENKINS_SPGRPCD	JENKINS_TOTAL_B1
1	-2.03360
2	-2.23040
3	-2.53840
4	-2.53560
5	-2.07730
6	-2.20940
7	-1.91230
8	-2.48000
9	-2.01270
10	-0.71520

32. JENKINS_TOTAL_B2

Jenkins total B2. Jenkins B2 coefficient used to estimate total aboveground ovendry biomass (pounds). This is coefficient B_1 from table 4 in Jenkins and others (2003). See appendix J for details on biomass equations.

Use JENKINS_TOTAL_B2 along with JENKINS_TOTAL_B1 to estimate total aboveground biomass [includes stem wood (bole), stump, bark, top, limbs, and foliage] with the equation below:

Total_agb = (Exp(JENKINS_TOTAL_B1 + JENKINS_TOTAL_B2 * ln(DIA*2.54)) * 2.2046)

JENKINS_SPGRPCD	JENKINS_TOTAL_B2
1	2.25920
2	2.44350
3	2.48140
4	2.43490
5	2.33230
6	2.38670
7	2.36510
8	2.48350
9	2.43420
10	1.70290

33. JENKINS_STEM_WOOD_RATIO_B1

Jenkins stem wood ratio B1. This is equivalent to coefficient B_0 for stem wood from table 6 in Jenkins and others (2003). The stem is defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix J for details on biomass equations.

The average proportion of aboveground biomass in stem wood is calculated using this equation:
stem_ratio = Exp(JENKINS_STEM_WOOD_RATIO_B1 + JENKINS_STEM_WOOD_RATIO_B2 / (DIA*2.54))

Species type	JENKINS_STEM_WOOD_RATIO_B1
Softwood	-0.3737
Hardwood	-0.3065

34. JENKINS_STEM_WOOD_RATIO_B2

Jenkins stem wood ratio B2. This is equivalent to coefficient B_1 for stem wood from table 6 in Jenkins and others (2003). The stem is defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix J for details on biomass equations.

The average proportion of aboveground biomass in stem wood is calculated using this equation:
stem_ratio = Exp(JENKINS_STEM_WOOD_RATIO_B1 + JENKINS_STEM_WOOD_RATIO_B2 / (DIA*2.54))

Species type	JENKINS_STEM_WOOD_RATIO_B2
Softwood	-1.8055
Hardwood	-5.4240

35. JENKINS_STEM_BARK_RATIO_B1

Jenkins stem bark ratio B1. This is equivalent to coefficient B_0 for stem bark from table 6 in Jenkins and others (2003). This ratio estimates bark biomass on the stem, defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix J for details on biomass equations.

The average proportion of aboveground biomass in stem bark is calculated using this equation:
bark_ratio = Exp(JENKINS_STEM_BARK_RATIO_B1 + JENKINS_STEM_BARK_RATIO_B2 / (DIA*2.54))

Species type	**JENKINS_STEM_BARK_RATIO_B1**
Softwood	-2.0980
Hardwood	-2.0129

36. JENKINS_STEM_BARK_RATIO_B2

Jenkins stem bark ratio B2. This is equivalent to coefficient B_1 for stem bark from table 6 in Jenkins and others (2003). This ratio estimates bark biomass on the stem, defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix J for details on biomass equations.

The average proportion of aboveground biomass in stem bark is calculated using this equation:
bark_ratio = Exp(JENKINS_STEM_BARK_RATIO_B1 + JENKINS_STEM_BARK_RATIO_B2 / (DIA*2.54))

Species type	**JENKINS_STEM_BARK_RATIO_B2**
Softwood	-1.1432
Hardwood	-1.6805

37. JENKINS_FOLIAGE_RATIO_B1

Jenkins foliage ratio B1. This is equivalent to coefficient B_0 for foliage from table 6 in Jenkins and others (2003). See appendix J for details on biomass equations.

The average proportion of aboveground biomass in foliage is calculated using:
foliage_ratio = Exp(JENKINS_FOLIAGE_RATIO_B1 + JENKINS_FOLIAGE_RATIO_B2 / (DIA*2.54))

Species type	**JENKINS_FOLIAGE_RATIO_B1**
Softwood	-2.9584
Hardwood	-4.0813

38. JENKINS_FOLIAGE_RATIO_B2

Jenkins foliage ratio B2. This is equivalent to coefficient B_1 for foliage from table 6 in Jenkins and others (2003). See appendix J for details on biomass equations.

The average proportion of aboveground biomass in foliage is calculated using:
foliage_ratio = Exp(JENKINS_FOLIAGE_RATIO_B1 + JENKINS_FOLIAGE_RATIO_B2 / (DIA*2.54)).

Species type	**JENKINS_FOLIAGE_RATIO_B2**
Softwood	4.4766
Hardwood	5.8816

39. JENKINS_ROOT_RATIO_B1

Jenkins root ratio B1. This is equivalent to coefficient B_0 for coarse roots from table 6 in Jenkins and others (2003). See appendix J for details on biomass equations.
The average proportion of coarse roots to total aboveground biomass is calculated using this equation:
root_ratio = Exp(JENKINS_ROOT_RATIO_B1 + JENKINS_ROOT_RATIO_B2 / (DIA*2.54))

Species type	**JENKINS_ROOT_RATIO_B1**
Softwood	-1.5619
Hardwood	-1.6911

40. JENKINS_ROOT_RATIO_B2

Jenkins root ratio B2. This is equivalent to coefficient B_1 for coarse roots from table 6 in Jenkins and others (2003). See appendix J for details on biomass equations.
The average proportion of coarse roots to total aboveground biomass is calculated using this equation:
root_ratio = Exp(JENKINS_ROOT_RATIO_B1 + JENKINS_ROOT_RATIO_B2 / (DIA*2.54))

Species type	**JENKINS_ROOT_RATIO_B2**
Softwood	0.6614
Hardwood	0.8160

41. JENKINS_SAPLING_ADJUSTMENT

Jenkins sapling adjustment factor. The biomass of saplings is based on biomass computed from Jenkins and others (2003) on the observed diameter multiplied by this adjustment factor. The sapling adjustment factor was computed as a national average ratio of the DRYBIOT (total dry biomass) divided by the Jenkins total biomass for all 5.0 inch trees, which is the size at which biomass based on volume begins. Because this adjustment factor was computed at the species level, there is a specific adjustment factor for each species. See appendix J for details on biomass equations.

42. MC_PCT_GREEN_WOOD

Moisture content of green wood as a percent of ovendry weight. Wood and bark are often sold based on green weight. The user is cautioned that green weights can be extremely variable geographically, seasonally, within species and across various portions of individual trees.

43. MC_PCT_GREEN_WOOD_CIT

Citation for MC_PCT_GREEN_WOOD_CIT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the MC_PT_GREEN_WOOD variable.

44. MC_PCT_GREEN_BARK

Moisture content of green bark as a percent of ovendry weight. Wood and bark are often sold based on green weight. The user is cautioned that green weights can be extremely variable geographically, seasonally, within species and across various portions of individual trees.

45. MC_PCT_GREEN_BARK_CIT

Citation for MC_PCT_GREEN_BARK. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the MC_PCT_GREEN_BARK variable.

46. RAILE_STUMP_DOB_B1

Raile stump diameter outside bark equation coefficient B1. This is equivalent to coefficient B from table 1 in Raile (1982). See appendix J for details on biomass equations.
This coefficient is used in an equation to estimate diameter outside bark at any point on the stump from ground to 1 foot high. From this, volume outside bark is estimated for the selected height along the stump. Volume inside bark is subtracted from volume outside bark to estimate bark volume. Both volumes are converted to biomass using either wood or bark specific gravities. (DOB and DIA are in inches, HT is in feet)
DOB = DIA + (DIA * RAILE_STUMP_DOB_B1 * (4.5-HT) / (HT+1))

47. RAILE_STUMP_DIB_B1

Raile stump diameter inside bark equation coefficient B1. This is equivalent to coefficient A from table 2 in Raile (1982). See appendix J for details on biomass equations.
This coefficient is used along with RAILE_STUMP_DIB_B2 in an equation to estimate diameter inside bark at any point on the stump from ground to 1 foot high. From this, volume inside bark is estimated for the selected height along the stump. Volume inside bark is subtracted from volume outside bark to estimate bark volume. Both volumes are converted to biomass using either wood or bark specific gravities. (DIB and DIA are in inches, HT is in feet)

DIB = (DIA * RAILE_STUMP_DIB_B1)+(DIA*RAILE_STUMP_DIB_B2 * (4.5-HT)/(HT+1))

48. RAILE_STUMP_DIB_B2

Raile stump diameter inside bark equation coefficient B2. This is equivalent to coefficient B from table 2 in Raile (1982). See appendix J for details on biomass equations.

This coefficient is used along with RAILE_STUMP_DIB_B1 in an equation to estimate diameter inside bark at any point on the stump from ground to 1 foot high. From this, volume inside bark is estimated for the selected height along the stump. Volume inside bark is subtracted from volume outside bark to estimate bark volume. Both volumes are converted to biomass using either wood or bark specific gravities. (DIB and DIA are in inches, HT is in feet)

DIB = (DIA * RAILE_STUMP_DIB_B1) +
(DIA * RAILE_STUMP_DIB_B2 * (4.5-HT) / (HT+1))

49. STANDING_DEAD_DECAY_RATIO1

    Standing dead decay ratio for decay class 1. Ratio of decayed wood density to undecayed wood density as indicated by decay class 1.

50. STANDING_DEAD_DECAY_RATIO2

    Standing dead decay ratio for decay class 2. Ratio of decayed wood density to undecayed wood density as indicated by decay class 2.

51. STANDING_DEAD_DECAY_RATIO3

    Standing dead decay ratio for decay class 3. Ratio of decayed wood density to undecayed wood density as indicated by decay class 3.

52. STANDING_DEAD_DECAY_RATIO4

    Standing dead decay ratio for decay class 4. Ratio of decayed wood density to undecayed wood density as indicated by decay class 4.

53. STANDING_DEAD_DECAY_RATIO5

    Standing dead decay ratio for decay class 5. Ratio of decayed wood density to undecayed wood density as indicated by decay class 5.

54. WOOD_SPGR_GREENVOL_DRYWT

    Green specific gravity of wood (green volume and oven-dry weight). This variable is used to determine the oven-dry weight (in pounds) of live and dead trees based on volume variables in the TREE table (VOLCFSND, VOLCFGRS, VOLCFNET…). These volumes are assumed to be green wood volumes. Oven-dry biomass for the sound volume in a tree can be calculated using this equation:

    B_{odw} = VOLCFSND x WOOD_SPGR_GREENVOL_DRYWT x 62.4

    Where:

    B_{odw} = sound oven-dry biomass of a tree in pounds

    VOLCFSND = sound volume of a tree in cubic feet

55. WOOD_SPGR_GREENVOL_DRYWT_CIT

    Citation for WOOD_SPGR_GREENVOL_DRYWT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the WOOD_SPGR_GREENVOL_DRYWT variable.

56. WOOD_SPGR_MC12VOL_DRYWT

    Wood specific gravity (12 percent moisture content volume and oven-dry weight). Used in biomass estimation of forest products (lumber, veneer, etc).

57. WOOD_SPGR_MC12VOL_DRYWT_CIT

    Citation for WOOD_SPGR_MC12VOL_DRYWT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the WOOD_SPGR_MC12VOL_DRYWT variable.

REF_SPECIES_GROUP (Reference Species Group crosswalk table)

	Column Name	Descriptive Name	Data Type
1	SWHW	Softwood or hardwood group	Text
2	SPGRPCD	Species group code	Integer
3	NAME	Name	Text
4	CLASS	Class	Text
5	REGION	Region	Text

1. SWHW — Softwood/ hardwood group. Indicates whether the species is a softwood or a hardwood. This column is used in queries to group and order tree records and display results. Sort by SWHW and then by SPGRPCD for an organized display.

2. SPGRPCD — Species group code. A code assigned to each tree species in order to group them for reporting purposes on presentation tables. Codes and their associated names (NAME) are shown in appendix G. Individual tree species and corresponding species group codes are shown in appendix F. Link REF_SPECIES_GROUP.SPGRPCD to TREE.SPGRPCD to translate codes to descriptive text.

3. NAME — Name. A descriptive name for each species group code (SPGRPCD). The names associated with these codes can be used to label summary tables. See appendix G.

4. CLASS — Class. A descriptor for the classification of the species type with the species group. Values are ‘SOFTWOOD’ and ‘HARDWOOD’. This column can be used in summary tables to sort and organize species names.

5. REGION — Region. A description of the section of the United States in which the species, and therefore species group is commonly found. Values are ‘EASTERN’ and ‘WESTERN’.

REF_FOREST_TYPE (Reference Forest Type crosswalk table)

	Column Name	Descriptive Name	Data Type
1	SWHW	Softwood or hardwood group	Text
2	VALUE	Numeric code for the forest type	Integer
3	REF_FORTYPCD	Numeric code for the forest type	Integer
4	MEANING	Written name of the forest type	Text
5	TYPGRPCD	Forest type group code	Integer
6	MANUAL_START	Manual version when forest type was initiated	Real
7	ALLOWED_IN_FIELD	Code is allowed as a field call	Text

1. SWHW — Softwood/ hardwood group. Indicates whether the forest type is a softwood, hardwood, or nonstocked type. This column is used in queries to group and order condition records by forest type. Sort by SWHW and then by FORTYPCD for an organized display.

2. VALUE — Value. A numeric code used for to identify a forest type numeric code. Link REF_FOREST_TYPE.VALUE to any of the following COND.FORTYPCD, COND.FLDTYPCD, or COND.FORTYPCDCALC to translate the numeric code to its descriptive name (MEANING). Refer to appendix D for a list of codes.

3. REF_FORTYPCD — Forest type code. A numeric code used for to identify a forest type numeric code. Link REF_FOREST_TYPE. FORTYPCD to any of the following COND.FORTYPCD, COND.FLDTYPCD, or COND.FORTYPCDCALC to translate the numeric code to its descriptive name (MEANING). Refer to appendix D for a list of codes.

4. MEANING — Meaning. The descriptive name corresponding with the forest type code (VALUE).The names associated with these codes are used to label rows or columns in queries or presentation tables. Refer to appendix D.

5. TYPGRPCD — Forest type group code. A code assigned to individual forest types in order to group them for reporting purposes. Link REF_FOREST_TYPE.TYPGRPCD to REF_FOREST_TYPE_GROUP. TYPGRPCD to translate numeric codes into descriptive names. Refer to appendix D.

6. MANUAL_START — Manual start. The first version of the Field Guide (PLOT.MANUAL) that the forest type code (VALUE) began to be used.

7. ALLOWED_IN_FIELD — Allowed in field. An indicator to show if a code (VALUE) is allowed to be used by the field crews. This is a Yes/No (Y/N) field. Specifically, forest type group codes are not allowed in the Field Guide nor is the code for a nonstocked forest type (999).

REF_FOREST_TYPE_GROUP (Reference Forest Type Group crosswalk table)

	Column Name	Descriptive Name	Data Type
1	SWHW	Softwood or hardwood group	Text
2	TYPGRPCD	Forest type group code	Integer
3	MEANING	Common name of the forest type	Text
4	VALUE	Forest type group code	Integer

1. SWHW — Softwood/ hardwood group. Indicates whether the forest type is a softwood, hardwood, or nonstocked type. This column is used in queries to group and order condition records by forest type. Sort by SWHW and then by TYPGRPCD for an organized display.

2. TYPGRPCD — Forest type group code. A code assigned to individual forest types in order to group them for reporting purposes. Link REF_FOREST_TYPE_GROUP.TYPGRPCD to REF_FOREST_TYPE.TYPGRPCD to translate numeric codes into descriptive names. Refer to appendix D.

3. MEANING — Meaning of numeric code. The descriptive common name corresponding with the forest type group numeric code. The names associated with these codes are used to label rows or columns in queries or presentation tables. Refer to appendix D

4. VALUE — Forest type group code. A code assigned to individual forest types in order to group them for reporting purposes. Link REF_FOREST_TYPE_GROUP.TYPGRPCD to REF_FOREST_TYPE.TYPGRPCD to translate numeric codes into descriptive names. Refer to appendix D. This column is the same name as the national FIADB, but it can cause problems with some software that consider this a reserved word.

REF_PLANT_DICTIONARY (Reference plant dictionary, species code crosswalk table)

	Column Name	Descriptive Name	Data Type
1	CN	Unique record number for this table.	Text
2	SYMBOL	Symbol is the NRCS code for the plant species.	Text
3	SYMBOL_TYPE	Symbol Type for the species	Text
4	SCIENTIFIC_NAME	Scientific Name for the plant symbol.	Text
5	NEW_SYMBOL	New plant symbol.	Text
6	NEW_SCIENTIFIC_NAME	New Scientific Name for the new symbol	Text
7	COMMON_NAME	Common name of species	Text
8	FAMILY	Family	Text
9	GENUS	Genus	Text
10	SPECIES	Species name	Text
11	SUBSPECIES	Subspecies name	Text
12	VAR	Variety	Text
13	VARIETY	Variety	Text
14	CATEGORY	Broad taxonomic category for the symbol	Text
15	DURATION	Duration of plant over time.	Text
16	GROWTH_HABIT	Growth Habit of the plant species.	Text
17	US_NATIVITY	Native to the US	Text
18	STATE_DISTRIBUTION	Distribution of plant across the U.S.	Text

1. CN — Unique record number. A unique number used to identify each record in this table.

2. SYMBOL — Symbol is the NRCS code (2000 download) used to represent a plant species. Use this column to link to the VEG_SP_PNWRS table, to crosswalk from codes to descriptive text.

3. SYMBOL_TYPE — Symbol Type describes the type of NRCS symbol (from 2000 download): Species - accepted symbol identified to species, subspecies or variety; Genus - accepted symbol identified to Genus; Old - synonym symbol for an old scientific name; Unknown - symbol to identify generic categories of unknown plants.

4. SCIENTIFIC_NAME — Scientific Name for the plant symbol.

5. NEW_SYMBOL — New Symbol that represents the new NRCS accepted code that has been reclassified from the Old synonym symbol.

6. NEW_SCIENTIFIC_NAME — New Scientific Name for the plant species if it has been given a new symbol. It represents the new NRCS accepted scientific name that has been reclassified from the Old synonym scientific name.

7. COMMON_NAME — Common name of the species.

8. FAMILY — Plant Family of symbol

9. GENUS — Genus. The genus name associated with the species code.

10. SPECIES — Species. The species name associated with the species code

11. SUBSPECIES — Subspecies. The subspecies name associated with the species code.

12. VAR — Variety indicator 'var.'

13. VARIETY — Variety. The variety name associated with the species code.

14. CATEGORY — Category indicates the broad taxonomic category for the symbol: Dicot, Fern, Gymnosperm, Horsetail, Lycopod, Monocot, Psilophyte, Quillwort. (Please note that Unknown symbols do not have a category.)

15. DURATION — Duration of plant according to NRCS 2000: Annual, Biennial, Perennial, Unknown. Some plants have different Durations depending on environment or location, so a plant can have more than one value.

16. GROWTH_HABIT — Growth Habit of symbol according to NRCS 2000: Forb/herb, Graminoid, Liana, Shrub, Subshrub, Tree, Vine. Some plants have different Growth Habits depending on environment or location, so a plant can have more than one value.

17. US_NATIVITY — Indicates whether the plant is native to the US.

18. STATE_DISTRIBUTION — State Distribution of plant according to NRCS download in 09-Nov-2007. This was the only update to NRCS 2000 plant list for this NIMS reference table.

REF_POP_EVAL_TYP_DESCR table (Reference Population Evaluation Type Description)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	EVAL_TYP	Evaluation type	Text
3	EVAL_TYP_DESCR	Evaluation type description	Text
4	EVAL_TYP_LABEL	Evaluation type label	Text

1. CN — Sequence number. A unique sequence number used to identify reference population evaluation type description record.

2. EVAL_TYP — Evaluation type. Evaluation types (EVAL_TYP) and the description of the evaluation types (EVAL_TYP_DESCR) are:

EVAL_TYP	Description
Expall	All plots: sampled and nonsampled
Expcurr	Sampled plots used for current area estimates
Expvol	Sampled plots used for tree inventory estimates

3. EVAL_TYP_DESCR — Evaluation type description. Evaluation types (EVAL_TYP) and the description of the evaluation types (EVAL_TYP_DESCR) are:

Evaluation type	EVAL_TYP_DESCR
Expall	All plots: sampled and nonsampled
Expcurr	Sampled plots used for current area estimates
Expvol	Sampled plots used for tree inventory estimates

4. EVAL_TYP_LABEL — Evaluation type

   Evaluation type label. The label used for the EVAL_TYP description.

REF_POP_ATTRIBUTE (Reference Population Attribute Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	ATTRIBUTE_NBR	Attribute number	Integer
3	ATTRIBUTE_DESCR	Attribute description	Text
4	TIMBERLAND	Timberland	Text
5	EVAL_TYP	Evaluation type	Text
6	EXPRESSION	Expression	Text
7	WHERE_CLAUSE	Where clause	Text
8	FOOTNOTE	Footnote	Text
9	ATTRIBUTE_GLOSSARY	Attribute glossary	Text

1. CN — Sequence number. A unique sequence number used to identify a reference population attribute record.

2. ATTRIBUTE_NBR — Attribute number. A numeric code used to identify an attribute record. See codes and descriptions in chapter 4, table 4.1.

3. ATTRIBUTE_DESCR — Attribute description. Examples include “Area of forestland (acres)” or “All live biomass on forestland oven-dry (short tons).” See codes and descriptions in chapter 4, table 4.1.

4. TMBERLAND — Timberland. A code indicating whether or not the attribute can be computed for a timberland species.

Code	Description
Y	Yes, the attribute can be computed for a timberland species
N	No, the attribute cannot be computed for a timberland species

5. EVAL_TYP — Evaluation type. Describes the type of evaluation. Evaluation type is needed to generate summary reports for an inventory. For example, a specific evaluation is associated with the evaluation for volume (Expvol). At the present time, seven types of evaluations can be produced. See also the REF_POP_EVAL_TYP_DESCR table.

6. EXPRESSION — Expression. SQL expression that identifies variables that are used to generate population estimate identified by ATTRIBUTE_DESCR (chapter 4, table 4.2).

7. WHERE_CLAUSE — Where clause. SQL where clause that identifies the appropriate method for joining tables and screening records to generate population estimate identified by REF_POP_ATTRIBUTE.ATTRIBUTE_DESCR (chapter 4, table 4.2).

8. FOOTNOTE — Footnote. Contains the footnote to be used in reports summarizing the attribute

9. ATTRIBUTE_GLOSSARY — Attribute glossary. Description of the attribute.

REF_STATE_ELEV (Reference State Elevation Table)

	Column Name	Descriptive Name	Data Type
1	STATECD	State code	Integer
2	MIN_ELEV	Minimum elevation	Integer
3	MAX_ELEV	Maximum elevation	Integer
4	LOWEST_POINT	Lowest point	Text
5	HIGHEST_POINT	Highest point	Text

1. STATECD — States code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.
2. MIN_ELEV — Minimum elevation. The minimum elevation within the state in feet.
3. MAX_ELEV — Maximum elevation. The maximum elevation within the state in feet.
4. LOWEST_POINT — Lowest point. The name of the lowest point within the state. 'SL' refers to sea level. Negative minimum elevations are listed here.
5. HIGHEST_POINT — Highest point. The name of the highest point within the state. Alternative names are provided also.

REF_UNIT (Reference Survey Unit Table)

	Column Name	Descriptive Name	Data Type
1	STATECD	State code	Integer
2	VALUE	Numeric code of the survey unit	Integer
3	MEANING	Descriptive name of the survey unit	Text

1. STATECD — States code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix C.
2. VALUE — Value. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C for codes. Link to numerous tables using both STATECD and VALUE=UNITCD.
3. MEANING — Meaning. The name corresponding to the survey unit code (VALUE) in the State (STATECD). Refer to appendix C.

REF_CITATION (Reference Publication Citation Table)

	Column Name	Descriptive Name	Data Type
1	CITATION_NBR	Citation number	Integer
2	CITATION	Citation	Text

1. CITATION_NBR Citation number. A unique number used to identify a REF_CITATION record. Citation information is currently available in the database only for information about the source of specific gravity and bark volume percent values contained in the REF_SPECIES table. REF_SPECIES variables ending in "_CIT" link back to the REF_CITATION table through CITATION_NBR.

2. CITATION Citation. This attribute is usually a publication citation. In some cases CITATION may contain more specific information about how data were populated for a field.

REF_HABTYP_DESCRIPTION (Reference Habitat Type Description Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	HABTYPCD	Habitat type code	Text
3	PUB_CD	Publication code	Text
4	SCIENTIFIC_NAME	Scientific name	Text
5	COMMON_NAME	Common name	Text
6	VALID	Valid	Text

1. CN Sequence number. A unique sequence number used to identify a habitat type description record.

2. HABTYPCD Habitat type code. A code representing a habitat type. Unique codes are determined by combining habitat type code and publication code (HABTYPCD and PUB_CD).

3. PUB_CD Publication code. A code indicating the publication that lists the name associated with a particular habitat type code (HABTYPCD). Use this to link REF_HABTYP_DESCRIPTION to REF_HABTYP_PUBLICATION.

4. SCIENTIFIC_NAME Scientific name. This attribute contains some type of descriptor, usually the Latin name, of the plant(s) associated with the habitat type code. It has values such as the entire scientific name or the shortened synonym of the plant(s) represented by the habitat type code or it may have an English geographic type of descriptor.

5. COMMON_NAME Common name. This attribute contains some type of descriptor, usually the common name, of the plant(s) associated with the habitat type code.

6. VALID Valid. A flag to indicate if this is a valid, documented habitat type code. Values are Y and N.

REF_HABTYP_PUBLICATION (Reference Habitat Type Publication Table)

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	PUB_CD	Publication code	Text
3	AUTHOR	Author of publication	Text
4	TITLE	Title of publication	Text
5	TYPE	Type of publication	Text
6	VALID	Valid	Text

1. CN — Sequence number. A unique sequence number used to identify a habitat type publication record.
2. PUB_CD — Publication code. A code indicating the publication that lists the name associated with a particular habitat type code (REF_HABTYP_DESCRIPTION.HABTYPCD).
3. AUTHOR — Author. The author of the publication defining particular habitat types.
4. TITLE — Title. The title of the publication defining particular habitat types.
5. TYPE — Type. An attribute describing if the habitat type publication describes potential vegetation or existing vegetation. Values are PVREF and EVREF. If it is unknown which type of habitat is being described, then TYPE = ?.
6. VALID — Valid. A flag to indicate if this publication is valid for FIA. Values are Y and N.

BOUNDARY (Boundary Table)

Note: this table is at the end of the list because it is rarely needed by most users.

	Column Name	Descriptive Name	Data Type
1	CN	Sequence number	Text
2	PLT_CN	Plot sequence number	Text
3	INVYR	Inventory year	Integer
4	STATECD	State code	Integer
5	UNITCD	Survey unit code	Integer
6	COUNTYCD	County code	Integer
7	PLOT	Phase 2 plot number	Integer
8	SUBP	Subplot number	Integer
9	SUBPTYP	Plot type code	Integer
10	AZMLEFT	Left azimuth	Integer
11	AZMRIGHT	Right azimuth	Integer
12	AZMCORN	Corner azimuth	Integer
13	CONTRAST	Contrasting condition	Integer
14	DISTCORN	Corner distance	Integer
15	CYCLE	Inventory cycle number	Integer
16	SUBCYCLE	Inventory subcycle number	Integer

1. CN — Sequence number. A unique number used to identify a boundary record.

2. PLT_CN — Plot sequence number. Foreign key linking the boundary record to the plot record. It is a unique number that identifies every record in the PLOT table. PLT_CN is found in most FIA tables, and is usually one of the key columns you will use to link to most other tables. Note that this column is not the field plot number, P2 hex number, or P3 hex number. Use this to link the BOUNDARY table to the PLOT table.

3. INVYR — Inventory year. The year when the inventory data were scheduled to be collected. INVYR is often (but not necessarily) the same as MEASYEAR, which is the year when the plot was actually visited and measured. See the SURVEY table for more info.

4. STATECD — State code.

STATECD	STATEAB	STATENM
6	CA	California
41	OR	Oregon
53	WA	Washington

5. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. Refer to appendix C.

6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C or the COUNTY table for codes.

7. PLOT — Phase 2 public plot number. An identifier for a plot. For PNW states, the combination of STATECD and PLOT will uniquely identify a plot record in the database. It is usually more convenient to use PLT_CN (or PLOT.CN) to identify unique plots in the inventory. PLT_CN numbers do not change over time.

8. SUBP — Subplot number. The number assigned to the subplot. The national plot design has subplot number values of 1 through 4.

9. SUBPTYP — Plot type code. Specifies whether boundary data are for a subplot, microplot, or macroplot.

Code	Description
1	Subplot boundary
2	Microplot boundary
3	Macroplot boundary

10. AZMLEFT — Left azimuth. The azimuth, to the nearest degree, from the subplot, microplot, or macroplot plot center to the farthest left point (facing the contrasting condition class) where the boundary intersects the subplot, microplot, or macroplot plot circumference.

11. AZMRIGHT — Right azimuth. The azimuth, to the nearest degree, from subplot, microplot, or macroplot plot center to the farthest right point (facing the contrasting condition) where the boundary intersects the subplot, microplot, or macroplot plot circumference.

12. AZMCORN — Corner azimuth. The azimuth, to the nearest degree, from the subplot, microplot, or macroplot plot 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 000 is recorded for AZMCORN.

13. CONTRAST — Contrasting condition. 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), e.g., the condition class present on the other side of the boundary.

14. DISTCORN — Corner distance. The horizontal distance, to the nearest 1 foot, from the subplot, microplot, or macroplot plot center to the boundary corner point. Blank (null) when AZMCORN equals 000; populated when BOUNDARY.AZMCORN is greater than 000.

15. CYCLE — Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a State estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

16. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes N years to measure all plots, subcycle shows in which of the N years of the cycle the data were measured.

Chapter 4 – Calculating Population Estimates

This chapter presents examples and descriptions of Access queries and procedures that can be used to obtain population estimates for many FIA attributes from the measurement data stored in the PNW-FIADB. These examples show how to construct queries, select data or grouping columns, and expand area, tree, and down wood estimates to the population level. Population estimates for many attributes can be generated using pre-defined queries found in the PNW-FIADB Microsoft Access database, which users can then modify based on their own needs and save as a new, re-usable query. Alternatively, estimates can be obtained by using the web-based tools "EVALIDator" or "Forest Inventory Data Online" (FIDO), which provide interactive access to the national FIADB (but not the PNW-FIADB). These tools can be found at http://fia.fs.fed.us/tools-data.

The FIADB can be used to estimate many attributes (e.g., forest area, timberland area, number of trees, net or gross volume, biomass using regional equations, biomass using CRM-Component Ratio Method procedures, carbon mass, coarse and fine woody debris, and other down woody material variables). The number of estimates that can be made from the FIADB is very large and knowledge about how to calculate and expand each attribute is essential to develop correct queries from the database. This chapter provides examples of common selection criteria, basic structures and components of common queries, and information about national estimation procedures.

An important difference between the PNW-FIADB and the national FIADB is the addition of the PLOT_PNW table to the Access database. This table pulls together key elements from the many national 'POP' tables that are found in the national database structure. These tables are numerous because they split up stratification related information into several tables. This allows the option of more complex databases that contain multiple stratifications and multiple types of forest inventories (periodic, annual, or other type). At the national level, inventories are at different stages in any given state, and it is up to the state or FIA work unit to choose the number and type of stratifications to include in their database. Stratifications can be by year, group of years, annual vs. periodic inventory design, or remeasurement status. The "POP" tables will contain specific information about the stratification, evaluation, area sampled, and sampling success (access denied, hazardous, or out of inventory plots).

In FIA estimation, the sample is a set of plots that were selected for the attribute of interest that was observed. The stratification consists of an assignment of plots to strata (non-overlapping areas of a known or estimated size) that in aggregate define the population of interest. There is an assignment of plots to every stratum, and all plots are assigned to one, and only one stratum, for each evaluation. FIA uses the term "evaluation" to reference the relationship that links a set of plots to a set of strata for estimation purposes. Thus, an evaluation is a set of plots defined in the FIADB that can be used to make a statistically valid sample-based estimate for a population (area of land) based on a specific stratification. Each evaluation used by FIA is identified, named, and stored as a single entry in the POP_EVAL table.

When we are not able to sample a portion of a plot because it was too hazardous or we were denied access to the property, we need to account for that unsampled area with a stratum adjustment factor. This factor is the inverse of the mean proportion of the sample plot areas that were within the population in each stratum. An adjustment factor is needed in most FIA queries to adjust the estimate for partial plots that were not sampled. Basically all the area associated with unsampled conditions is distributed among the other conditions found on the plot.

Although the national database structure provides flexibility in terms of the number and type of stratifications to include, the result is a database with numerous POP tables that must be carefully linked or joined in a certain way. This is followed by the user selecting a particular set of codes to identify a specific stratification and evaluation. The national database structure has become complex.

The PLOT_PNW table removes much of the complexity surrounding expansion factors and adjustment factors because the table contains all of these factors, currently found in multiple POP tables in the national database. Both sets of factors are needed to develop estimates for the current PNW Phase 2 stratification. At this time, PNW uses only one stratification to produce summary tables for the annual inventory. This stratification includes sampled plots from all years that have been completed in the 10 year inventory cycle. For example, the current stratification includes plots from the years 2004-2013, which is 100% of the plots that could be measured in the 10 year cycle.

The PLOT_PNW table greatly simplifies creating queries that produce population estimates (fewer tables need to be included, along with fewer relational links). This table will be included in most queries that you create, and is used to estimate the total amount of an attribute (e.g. volume in million cubic feet, biomass in tons, timberland acres) or the average (mean) per-acre value for the attribute (e.g. volume/acre, trees/acre).

In this chapter, examples and helpful hints are presented that show you how to create queries for many land area, tree, and down wood summaries. Partial or full queries will be displayed as SQL code, which can be modified and pasted into the Access query window or into existing SQL scripts.

Common Selection Criteria for Queries

FIA data are often summarized for forest land or timberland, for reserved or unreserved areas, for live or dead trees, or for growing stock or sawtimber volume. Common selection criteria used when creating queries include various classifications of land and groups of trees as shown below:

Identifying land classes (COND table):

Forest land	COND_STATUS_CD=1
Timberland	COND_STATUS_CD=1, SITECLCD <7, RESERVCD=0
Nonforest land	COND_STATUS_CD=2
Reserved land	RESERVCD=1
Unreserved land	RESERVCD=0
Productive forest land	COND_STATUS_CD=1, SITECLCD <7
Unproductive forest land	COND_STATUS_CD=1, SITECLCD = 7

Identifying tree characteristics:

Live trees	TREE.STATUSCD=1
Standing dead trees	TREE.STATUSCD=2 , TREE.STANDING_DEAD_CD=1
Growing stock trees	TREE.STATUSCD=1 , TREE.TREECLCD=2
Growing stock volume	TREE.STATUSCD=1, TREE.TREECLCD=2, TREE.DIA>=5.0
Sawtimber volume	TREE.STATUSCD=1, TREE.TREECLCD=2, (TREE.SPCD < 300 AND TREE.DIA>=9.0), (TREE.SPCD >= 300 AND TREE.DIA>=11.0)

It is helpful to study the pre-defined queries that come with the PNW-FIADB to see what columns are used to select various criteria and what columns are used as the summary variable. They also illustrate how to convert units, bring in reference tables to enhance your output, expand tree and area columns to produce population estimates, and how to construct both simple and crosstab queries.

Column names of Common Tree Attributes to Summarize in FIA Queries

The columns listed below are tree attributes that are often used in summaries of FIA data. They range from number of trees, to volume, to biomass and carbon. Please refer to the individual column definitions for more explanation about the attributes. The column names can be used inside queries or SQL statements as the variable to sum or average for an analysis.

Note: **Mechantable bole** referred to below is the portion of the stem from a 1-foot stump to a 4" top diameter for cubic volume. The **sawlog portion** of a tree is for sawtimber sized trees, which is either 1-foot stump to a 7" top diameter for softwoods (SW) or 9" top diameter for hardwoods (HW). Boardfoot volumes are always calculated for the sawlog portion of a tree and for sawtimber-sized trees.

Column Name	Description	Table
TPA_UNADJ	Number of trees	TREE
VOLCFGRS	Gross cubic volume of the merchantable bole, cuft (DIA >= 5")	TREE
VOLCFNET	Net cubic volume of the merchantable bole, cuft (DIA >= 5")	TREE
VOLCFSND	Sound cubic volume of the merchantable bole, cuft (DIA >= 5")	TREE
VOLCSGRS	Gross cubic volume of the sawlog portion of the tree, cuft (DIA >= 9" SW, >=11"HW)	TREE
VOLCSNET	Net cubic volume of the sawlog portion of the tree, cuft (DIA >= 9" SW, >=11"HW))	TREE
VOLUME_ TOTAL_STEM_WOOD	Gross cubic wood volume of the entire tree, ground to tip, cuft (DIA >= 1")	TREE_PNW
VOLBFGRS	Gross board foot volume of the sawlog portion of the tree, Int. ¼"rule, bdft (DIA >= 9" SW, >=11"HW)	TREE
VOLBFNET	Net board foot volume of the sawlog portion of the tree, Int. ¼"rule, bdft (DIA >= 9" SW, >=11"HW)	TREE
VOLBFGRS_SCRIBNER	Gross board foot volume of the sawlog portion of the tree, Scribner rule, bdft (DIA >= 9" SW, >=11"HW)	TREE_PNW
VOLBFNET_SCRIBNER	Net board foot volume of the sawlog portion of the tree, Scribner rule, bdft (DIA >= 9" SW, >=11"HW)	TREE_PNW
REGIONAL_DRYBIOM	Biomass of the merchantable bole, excluding bark, regional equations, pounds (DIA >= 5")	TREE_REGIONAL_BIOMASS
REGIONAL_DRYBIOT	Biomass of the total tree, excluding foliage, regional equations, pounds (DIA >= 1")	TREE_REGIONAL_BIOMASS
DRYBIO_BG	Biomass below ground, modeled, CRM, pounds (DIA >= 5")	TREE
DRYBIO_BOLE	Biomass of the sound merchantable bole, including bark, CRM, pounds (DIA >= 5")	TREE
DRYBIO_STUMP	Biomass of the stump, modeled, CRM, pounds (DIA >= 5")	TREE
DRYBIO_TOP	Biomass of the tree tip and branches, excluding foliage, modeled, CRM, pounds (DIA >= 5")	TREE

Column Name	Description	Table
DRYBIO_SAPLING	Biomass of saplings, modeled, CRM, pounds (DIA >= 1 and < 5")	TREE
CARBON_AG	Carbon mass, total above ground, excluding foliage, (sum of the DRYBIO columns*.5), CRM, pounds	TREE
CARBON_BG	Carbon mass, total below ground, modeled, CRM, pounds	TREE
CWD_LPA_ADJ	Number of CWD logs, >= 3" transect diam.	DWM_COND_DWM_CALC
CWD_CARBON_ADJ	Carbon mass of CWD logs, >= 3" transect diam., pounds	DWM_COND_DWM_CALC
CWD_DRYBIO_ADJ	Biomass of CWD logs, >= 3" transect diam., pounds	DWM_COND_DWM_CALC
CWD_VOLCF_ADJ	Cubic volume of CWD logs, >= 3" transect diameter, pounds	DWM_COND_DWM_CALC
FWD_CARBON_TOTAL_ADJ	Carbon mass of all FWD, pounds (DIA <3")	DWM_COND_DWM_CALC
FWD_DRYBIO_TOTAL_ADJ	Biomass of all FWD, pounds (DIA <3")	DWM_COND_DWM_CALC
FWD_VOLCF_TOTAL_ADJ	Cubic volume of all FWD, cuft (DIA <3")	DWM_COND_DWM_CALC

Basic elements of PNW FIA Queries

Note that an adjustment factor is needed in FIA queries to adjust the estimate for partial plots that were not sampled due to being hazardous or because we were denied access to the property. Basically all the area associated with those unsampled conditions is distributed among the other conditions on the plot.

Area estimates in acres:
Include PLOT_PNW and COND tables in the query

Sampled area: (to summarize the number of acres within a category such as forest type)

[PLOT_PNW**!EXPCURR]*[**COND**!CONDPROP_UNADJ]*[**PLOT_PNW**!ADJ_FACTOR_EXPCURR]**

Tree estimates (in cubic feet, board feet, pounds, etc):
Include PLOT_PNW, COND, TREE, and/or TREE_REGIONAL_BIOMASS, TREE_PNW, reference tables

[*TABLENAME!TREE_COLUMN_NAME***] * [**TREE**!TPA_UNADJ] * [**PLOT_PNW**!EXPVOL] * ADJFAC**

Where ADJFAC is one of 3 values. Here we use the 'Switch' function to select the correct factor based on the tree's TPA (you can also use the IIF function):

(Switch([TREE**!TPA_UNADJ]=0.999188, [**PLOT_PNW**!ADJ_FACTOR_MACR],**
[TREE**!TPA_UNADJ]=6.018046, [**PLOT_PNW**!ADJ_FACTOR_SUBP],**
[TREE**!TPA_UNADJ]=74.965282, [**PLOT_PNW**!ADJ_FACTOR_MICR))**

The way the Switch function works:
If the TPA_UNAD is 0.999188 use the ADJ_FACTOR_MACR, if TPA_UNAD is 6.018046 use the ADJ_FACTOR_SUBP, and if TPA_UNAD is 74.965282 use the ADJ_FACTOR_MICR.

Down wood -- CWD or FWD estimates (in cubic feet, pounds, number of logs, etc):
Include PLOT_PNW_2010, DWM_COND_DWM_CALC, and/or COND tables

[DWM_COND_DWM_CALC **!CWD COLUMN NAME_ADJ]* [**PLOT_PNW_2010**!EXPVOL]**

[DWM_COND_DWM_CALC**!FWD COLUMN NAME_ADJ]* [**PLOT_PNW_2010**!EXPVOL]**

Examples and components of Common PNW FIA queries

Table Alias Names (for example, refer to the PLOT_PNW table using 'plp'):
plp= PLOT_PNW
plp2= PLOT_PNW_2010 (for down wood estimates)
p=PLOT
c=COND
t=TREE
tp=TREE_PNW
tb=TREE_REGIONAL_BIOMASS
dwm= DWM_COND_DWM_CALC

Number of all live trees on timberland (thous):
Basic summary statement: (plp.EXPVOL * t.tpa_UNADJ * ADJFAC)/1000
Where: t.STATUSCD=1, COND_STATUS_CD=1, SITECLCD <7, RESERVCD=0 and DIA >=1

Number of dead trees on forest land (thous):
Basic summary statement: (plp.EXPVOL * t.tpa_UNADJ * ADJFAC)/1000
Where: t.STATUSCD=2, c.COND_STATUS_CD=1

Gross Cubic volume of all live trees with a DBH>= 5 inches on timberland:
Basic summary statement: t.VOLCFGRS * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1, c.SITECLCD <7, c.RESERVCD=0 and t.DIA >=5

Net Cubic volume of all live trees with a DBH>= 5 inches on timberland:
Basic summary statement: t.VOLCFNET * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1, c.SITECLCD <7, c.RESERVCD=0 and t.DIA >=5

Net Cubic volume of growing stock trees with a DBH>= 5 inches on timberland:
Basic summary statement: t.VOLCFNET * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1, t.TREECLCD=2, c.SITECLCD <7, c.RESERVCD=0 and t.DIA >=5

Net Sound Cubic volume of all live trees with a DBH>= 5 inches on timberland:
Basic summary statement: t.VOLCFSND * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1, c.SITECLCD <7, c.RESERVCD=0 and t.DIA >=5

Net Sawtimber volume on timberland (bdft, International ¼" rule):
Basic summary statement: t.VOLBFNET * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1, c.SITECLCD <7, c.RESERVCD=0

Net Sawtimber volume on timberland (bdft, Scribner rule):
Basic summary statement: tp.VOLBFNET_SCRIBNER * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1, c.SITECLCD <7, c.RESERVCD=0

Total above ground biomass of all live trees on forest land, in pounds—using regional equations:
Basic summary statement: tb.DRYBIOT * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1

Total above ground carbon of all live trees on forest land, in tons—using regional equations:
Basic summary statement: ((tb.DRYBIOT * plp.EXPVOL * t.TPA_UNADJ) * **0.5** * ADJFAC) / 2000
Where: t.STATUSCD=1, c.COND_STATUS_CD=1

Top and branch biomass of all live trees on forest land, in pounds—using CRM equations:
Basic summary statement: t.DRYBIO_TOP * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1

Stump biomass of all live trees on forest land, in pounds—using CRM equations:
Basic summary statement: t.DRYBIO_STUMP * plp.EXPVOL * t.TPA_UNADJ * ADJFAC
Where: t.STATUSCD=1, c.COND_STATUS_CD=1

Biomass of coarse woody debris on forest land, in pounds:
Basic summary statement: dwm.CWD_DRYBIO_ADJ * plp2.EXPVOL
Where: c.COND_STATUS_CD=1

Area of forest land in the Redwood forest type:
Basic summary statement: plp.EXPCURR * c.CONDPROP_UNADJ * plp.ADJ_FACTOR_EXPCURR
Where: c.COND_STATUS_CD=1, c.FORTYPCD=341

Area of forest land owned by private owners in the Douglas-fir forest type:
Basic summary statement: plp.EXPCURR * c.CONDPROP_UNADJ * plp.ADJ_FACTOR_EXPCURR
Where: c.COND_STATUS_CD=1, c.FORTYPCD=201, c.OWNCD=46

From these examples, users can copy pieces of the statements into the appropriate section in the Access query window. The basic summary statement could be pasted into the 'Field' row of the query window, dropping the table aliases, and choosing the 'sum' option in the Total row. The where statement can be used as a reference, identifying which columns you need to add to the query and then what value to enter into the Selection Criteria row in the query window.

Using the PNW-FIADB user interface will greatly speed up running queries and moving around in the database. Well over 150 pre-defined Queries have been built and stored in the database, and should serve as a template from which users can modify and customize to fit a particular need.

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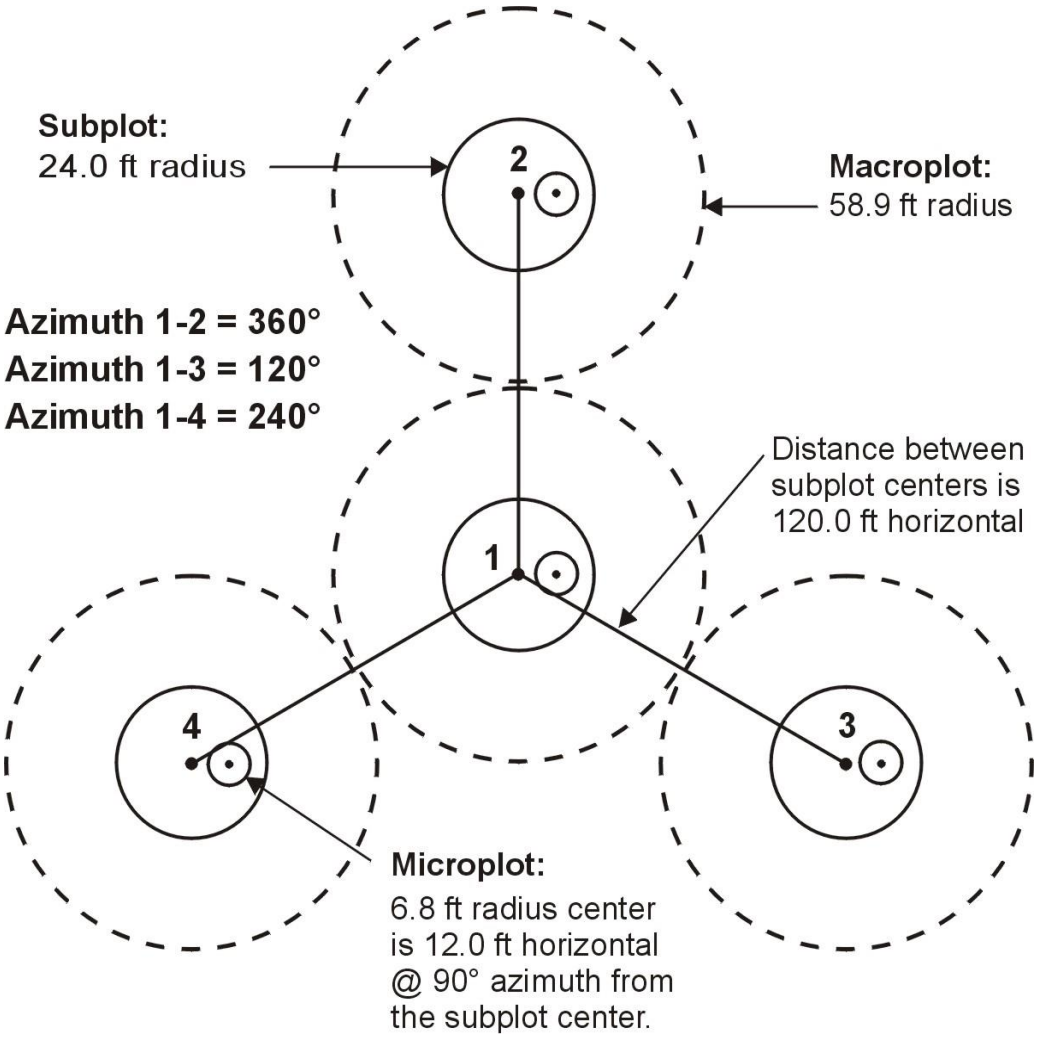
Appendix A. FIA Plot Design

The FIA mapped plot design. Subplot 1 is the center of the cluster with subplots 2, 3, and 4 located 120 feet away at azimuths of 360°, 120°, and 240°, respectively.



Appendix B. Forest Inventory and Analysis (FIA) Design Codes and Definitions by Region

Region	Design Code (DESIGNCD)	Definition
[e]PNWRS	1	National plot design consists of four, 24 foot fixed-radius subplots for trees ≥ 5 inches DBH, and four, 6.8 foot fixed-radius microplots for seedlings and trees ≥ 1 and < 5 inches DBH. Subplot 1 is the center plot, and subplots 2, 3, and 4 are located 120.0 feet, horizontal, at azimuths of 360, 120, and 240, respectively. The microplot center is 12 feet east of the subplot center. Four, 58.9 feet fixed-radius macroplots are optional. A plot may sample more than one condition. When multiple conditions are encountered, condition boundaries are delineated (mapped).
[e]PNWRS	501	DESIGNCD 1 with optional macroplot. Trees ≥ 24 inches DBH are tallied on macroplot.
	502	DESIGNCD 1 with optional macroplot. Trees ≥ 30 inches DBH are tallied on macroplot.
	503	DESIGNCD 1 with optional macroplot. Trees ≥ 24 inches DBH are tallied on macroplot. Trees ≥ 32 inches DBH are tallied on one 1-hectare plot.
	504	DESIGNCD 1 with optional macroplot. Trees ≥ 24 inches DBH are tallied on macroplot. Trees ≥ 48 inches DBH are tallied on one 1-hectare plot.
	505	DESIGNCD 1 with optional macroplot. Trees ≥ 30 inches DBH are tallied on macroplot. Trees ≥ 48 inches DBH are tallied on one 1-hectare plot.
[e]PNWRS	999	A plot record created to represent reserved or other nonsampled or undersampled areas where there were no ground plots; the plot has no design type; rather, it is a placeholder for area estimates. In all cases where DESIGNCD 999 plots are present, they are only used for estimates of area; they are not used in estimates of numbers of trees, volume or change (i.e., tree level estimates).

[e]Pacific Northwest Research Station

Other Acronyms and definitions:
BAF – basal area factor
DRC – Diameter at root collar

Appendix C. State, Survey Unit, and County Codes

State Code: 6 **State Name:** California **State Abbreviation:** CA **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: North Coast

County code and county name							
15	Del Norte	23	Humboldt	45	Mendocino	97	Sonoma

Survey Unit Code: 2 **Survey Unit Name**: North Interior

County code and county name					
35	Lassen	89	Shasta	105	Trinity
49	Modoc	93	Siskiyou		

Survey Unit Code: 3 **Survey Unit Name**: Sacramento

County code and county name							
7	Butte	33	Lake	63	Plumas	103	Tehama
11	Colusa	55	Napa	67	Sacramento	113	Yolo
17	El Dorado	57	Nevada	91	Sierra	115	Yuba
21	Glenn	61	Placer	101	Sutter		

Survey Unit Code: 4 **Survey Unit Name**: Central Coast

County code and county name							
1	Alameda	69	San Benito	83	Santa Barbara	111	Ventura
13	Contra Costa	75	San Francisco	85	Santa Clara		
41	Marin	79	San Luis Obispo	87	Santa Cruz		
53	Monterey	81	San Mateo	95	Solano		

Survey Unit Code: 5 **Survey Unit Name**: San Joaquin

County code and county name							
3	Alpine	29	Kern	47	Merced	107	Tulare
5	Amador	31	Kings	51	Mono	109	Tuolumne
9	Calaveras	39	Madera	77	San Joaquin		
19	Fresno	43	Mariposa	99	Stanislaus		

Survey Unit Code: 6 **Survey Unit Name**: Southern

County code and county name							
25	Imperial	37	Los Angeles	65	Riverside	73	San Diego
27	Inyo	59	Orange	71	San Bernardino		

Survey Unit Code: 0 **Survey Unit Name**: Northwest

County code and county name							
5	Clackamas	27	Hood River	53	Polk	71	Yamhill
7	Clatsop	47	Marion	57	Tillamook		
9	Columbia	51	Multnomah	67	Washington		

Survey Unit Code: 1 **Survey Unit Name**: West Central

County code and county name							
3	Benton	39	Lane	41	Lincoln	43	Linn

Survey Unit Code: 2 **Survey Unit Name**: Southwest

County code and county name					
11	Coos	19	Douglas	33	Josephine
15	Curry	29	Jackson		

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name					
13	Crook	31	Jefferson	55	Sherman
17	Deschutes	35	Klamath	65	Wasco
21	Gilliam	37	Lake	69	Wheeler

Survey Unit Code: 4 **Survey Unit Name**: Blue Mountains

County code and county name							
1	Baker	25	Harney	49	Morrow	61	Union
23	Grant	45	Malheur	59	Umatilla	63	Wallowa

State Code: 53 **State Name:** Washington **State Abbreviation:** WA **Region/Station Code:** 26

Survey Unit Code: 5 **Survey Unit Name**: Puget Sound

County code and county name							
29	Island	35	Kitsap	55	San Juan	61	Snohomish
33	King	53	Pierce	57	Skagit	73	Whatcom

Survey Unit Code: 6 **Survey Unit Name**: Olympic Peninsula

County code and county name					
9	Clallam	31	Jefferson	67	Thurston
27	Grays Harbor	45	Mason		

Survey Unit Code: 7 **Survey Unit Name**: Southwest

County code and county name					
11	Clark	41	Lewis	59	Skamania
15	Cowlitz	49	Pacific	69	Wahkiakum

Survey Unit Code: 8 **Survey Unit Name**: Central

County code and county name					
7	Chelan	37	Kittitas	47	Okanogan
17	Douglas	39	Klickitat	77	Yakima

Survey Unit Code: 9 **Survey Unit Name**: Inland Empire

County code and county name							
1	Adams	19	Ferry	43	Lincoln	71	Walla Walla
3	Asotin	21	Franklin	51	Pend Oreille	75	Whitman
5	Benton	23	Garfield	63	Spokane		
13	Columbia	25	Grant	65	Stevens		

Appendix D. FOREST TYPE Codes, Groups, and Names.

Code	Forest type / type group
	SOFTWOOD TYPES
120	**Spruce / fir group**
122	White spruce
125	Black spruce
180	**Pinyon / juniper group**
184	Juniper woodland
185	Pinyon / juniper woodland
200	**Douglas-fir group**
201	Douglas-fir
202	Port-Orford-cedar
203	Bigcone Douglas-fir
220	**Ponderosa pine group**
221	Ponderosa pine
222	Incense-cedar
224	Sugar pine
225	Jeffrey pine
226	Coulter pine
240	**Western white pine group**
241	Western white pine
260	**Fir / spruce / mountain hemlock group**
261	White fir
262	Red fir
263	Noble fir
264	Pacific silver fir
265	Engelmann spruce
266	Engelmann spruce / subalpine fir
267	Grand fir
268	Subalpine fir
269	Blue spruce
270	Mountain hemlock
271	Alaska-yellow-cedar
280	**Lodgepole pine group**
281	Lodgepole pine
300	**Hemlock / Sitka spruce group**
301	Western hemlock
304	Western redcedar
305	Sitka spruce
320	**Western larch group**
321	Western larch
340	**Redwood group**
341	Redwood
342	Giant sequoia
360	**Other western softwoods group**
361	Knobcone pine
362	Southwestern white pine
363	Bishop pine
364	Monterey pine
365	Foxtail pine / bristlecone pine
366	Limber pine
367	Whitebark pine
368	Miscellaneous western softwoods
350	**Western juniper**
369	Western juniper
370	**California mixed conifer group**
371	California mixed conifer
390	**Other softwoods group**
391	Other softwoods
	HARDWOOD TYPES
700	**Elm / ash / cottonwood group**
703	Cottonwood
704	Willow
709	Cottonwood / willow
722	Oregon ash
900	**Aspen / birch group**
901	Aspen
902	Paper birch
910	**Alder / maple group**
911	Red alder
912	Bigleaf maple
920	**Western oak group**
921	Gray pine
922	California black oak
923	Oregon white oak
924	Blue oak
931	Coast live oak
933	Canyon live oak
934	Interior live oak
935	California white oak (valley oak)

Code	Forest type / type group
940	**Tanoak / laurel group**
941	Tanoak
942	California laurel
943	Giant chinkapin
960	**Other hardwoods group**
961	Pacific madrone
962	Other hardwoods
970	**Woodland hardwoods group**
971	Deciduous oak woodland
972	Evergreen oak woodland
973	Mesquite woodland
974	Mountain mahogany woodland
975	Intermountain maple woodland
976	Miscellaneous woodland hardwoods
990	**Eucalyptus hardwoods group (in PNW)**
993	Eucalyptus
999	**Nonstocked**

Appendix E. Administrative National Forest Codes and Names

Region	Code	National Forest/Grassland/Area
Region 1	104	Idaho Panhandle
Region 4	417	Toiyabe
Region 5	501	Angeles
	502	Cleveland
	503	Eldorado
	504	Inyo
	505	Klamath
	506	Lassen
	507	Los Padres
	508	Mendocino
	509	Modoc
	510	Six Rivers
	511	Plumas
	512	San Bernardino
	513	Sequoia
	514	Shasta-Trinity
	515	Sierra
	516	Stanislaus
	517	Tahoe
	519	Lake Tahoe Basin
Region 6	601	Deschutes
	602	Fremont
	603	Gifford Pinchot
	604	Malheur
	605	Mt. Baker-Snoqualmie
	606	Mt. Hood
	607	Ochoco
	608	Okanogan
	609	Olympic
	610	Rogue River
	611	Siskiyou
	612	Siuslaw
	614	Umatilla
	615	Umpqua
	616	Wallowa-Whitman
	617	Wenatchee
	618	Willamette
	620	Winema
	621	Colville
	622	Columbia River Gorge NSA
	650	Crooked River National Grassland

Appendix F. Tree Species Codes, Names, and Occurrences

Major groups (MAJGRP) are (1) pines, (2) other softwoods, (3) soft hardwoods, and (4) hard hardwoods. The 48 species groups (SPGRPCD) can be found in appendix G. The FIA work units listed are NC – (former) North Central, NE – (former) Northeastern, PNW – Pacific Northwest, RM – Rocky Mountain, and SO – Southern.

						Occurrence by FIA work unit				
SPCD	**COMMON_NAME**	**Scientific Name**	**SPGRPCD**		**MAJGRP**	**NC**	**NE**	**PNW**	**RM**	**SO**
			East	West						
10	fir spp.	*Abies* spp.	6	12	2	X	X			X
11	Pacific silver fir	*Abies amabilis*	9	12	2			X		
12	balsam fir	*Abies balsamea*	6	12	2	X	X			X
14	Santa Lucia or bristlecone fir	*Abies bracteata*	9	12	2			X		
15	white fir	*Abies concolor*	9	12	2	X		X	X	X
16	Fraser fir	*Abies fraseri*	9	12	2	X	X			X
17	grand fir	*Abies grandis*	9	12	2			X	X	
18	corkbark fir	*Abies lasiocarpa* var. *arizonica*	9	12	2				X	X
19	subalpine fir	*Abies lasiocarpa*	9	12	2			X	X	X
20	California red fir	*Abies magnifica*	9	12	2			X	X	
21	Shasta red fir	*Abies shastensis*	9	12	2			X	X	
22	noble fir	*Abies procera*	9	12	2			X	X	
40	white-cedar spp.	*Chamaecyparis* spp.	9	24	2		X	X		
41	Port-Orford-cedar	*Chamaecyparis lawsoniana*	9	24	2			X		
42	Alaska yellow-cedar	*Chamaecyparis nootkatensis*	9	24	2			X		
43	Atlantic white-cedar	*Chamaecyparis thyoides*	9	24	2		X			X
50	cypress	*Cupressus* spp.	9	24	2			X		
51	Arizona cypress	*Cupressus arizonica*	9	24	2			X	X	X
52	Baker or Modoc cypress	*Cupressus bakeri*	9	24	2			X		
53	Tecate cypress	*Cupressus forbesii*	9	24	2			X		
54	Monterey cypress	*Cupressus macrocarpa*	9	24	2			X		
55	Sargent's cypress	*Cupressus sargentii*	9	24	2			X		
56	MacNab's cypress	*Cupressus macnabiana*	9	24	2			X		
57	redcedar/juniper spp.	*Juniperus* spp.	9	23	2	X	X			X
58	Pinchot juniper	*Juniperus pinchotii*	23	23	2				X	X
59	redberry juniper	*Juniperus coahuilensis*	23	23	2				X	X
60	Drooping juniper	*Juniperus flaccida*	23	23	2					X
61	Ashe juniper	*Juniperus ashei*	23	23	2	X				X
62	California juniper	*Juniperus californica*	23	23	2			X	X	
63	alligator juniper	*Juniperus deppeana*	23	23	2				X	X
64	western juniper	*Juniperus occidentalis*	9	24	2			X	X	
65	Utah juniper	*Juniperus osteosperma*	23	23	2			X	X	X
66	Rocky Mountain juniper	*Juniperus scopulorum*	23	23	2	X		X	X	X
67	southern redcedar	*Juniperus virginiana* var. *silicicola*	9	24	2					X
68	eastern redcedar	*Juniperus virginiana*	9	24	2	X	X		X	X
69	oneseed juniper	*Juniperus monosperma*	23	23	2				X	X
70	larch spp.	*Larix* spp.	9	24	2	X	X			
71	tamarack (native)	*Larix laricina*	9	24	2	X	X	X		

						Occurrence by FIA work unit				
SPCD	**COMMON_NAME**	**Scientific Name**	**SPGRPCD**		**MAJGRP**	**NC**	**NE**	**PNW**	**RM**	**SO**
			East	West						
72	subalpine larch	*Larix lyallii*	9	24	2			X	X	
73	western larch	*Larix occidentalis*	9	19	2			X	X	
81	incense-cedar	*Calocedrus decurrens*	9	20	2			X	X	
90	spruce spp.	*Picea* spp.	6	18	2	X	X			X
91	Norway spruce	*Picea abies*	9	18	2	X	X			X
92	Brewer spruce	*Picea breweriana*	9	18	2			X		
93	Engelmann spruce	*Picea engelmannii*	9	18	2	X		X	X	X
94	white spruce	*Picea glauca*	6	18	2	X	X	X	X	X
95	black spruce	*Picea mariana*	6	18	2	X	X	X		X
96	blue spruce	*Picea pungens*	9	18	2	X	X		X	X
97	red spruce	*Picea rubens*	6	18	2		X			X
98	Sitka spruce	*Picea sitchensis*	9	17	2			X		
100	pine spp.	*Pinus* spp.	9	24	1	X	X	X		X
101	whitebark pine	*Pinus albicaulis*	9	24	1			X	X	
102	Rocky Mountain bristlecone pine	*Pinus aristata*	9	24	1			X	X	X
103	knobcone pine	*Pinus attenuata*	9	24	1			X	X	
104	foxtail pine	*Pinus balfouriana*	9	24	1			X	X	
105	jack pine	*Pinus banksiana*	5	24	1	X	X			
106	common or two-needle pinyon	*Pinus edulis*	23	23	1			X	X	X
107	sand pine	*Pinus clausa*	3	24	1					X
108	lodgepole pine	*Pinus contorta*	9	21	1	X		X	X	
109	Coulter pine	*Pinus coulteri*	9	24	1			X		
110	shortleaf pine	*Pinus echinata*	2	24	1	X	X			X
111	slash pine	*Pinus elliottii*	1	24	1					X
112	Apache pine	*Pinus engelmannii*	9	24	1				X	
113	limber pine	*Pinus flexilis*	9	24	1	X		X	X	X
114	southwestern white pine	*Pinus strobiformis*	9	24	1				X	X
115	spruce pine	*Pinus glabra*	3	24	1					X
116	Jeffrey pine	*Pinus jeffreyi*	9	11	1			X	X	
117	sugar pine	*Pinus lambertiana*	9	14	1			X	X	
118	Chihuahua pine	*Pinus leiophylla*	9	24	1				X	X
119	western white pine	*Pinus monticola*	9	15	1			X	X	
120	bishop pine	*Pinus muricata*	9	24	1			X		
121	longleaf pine	*Pinus palustris*	1	24	1					X
122	ponderosa pine	*Pinus ponderosa*	9	11	1	X		X	X	X
123	Table Mountain pine	*Pinus pungens*	3	24	1		X			X
124	Monterey pine	*Pinus radiata*	9	24	1			X		
125	red pine	*Pinus resinosa*	4	24	1	X	X			X
126	pitch pine	*Pinus rigida*	3	24	1		X			X
127	gray pine	*Pinus sabiniana*	9	24	1			X		
128	pond pine	*Pinus serotina*	3	24	1		X			X
129	eastern white pine	*Pinus strobus*	4	24	1	X	X			X
130	Scotch pine	*Pinus sylvestris*	3	24	1	X	X	X	X	X
131	loblolly pine	*Pinus taeda*	2	24	1	X	X			X

						Occurrence by FIA work unit				
SPCD	**COMMON_NAME**	**Scientific Name**	**SPGRPCD**		**MAJGRP**	**NC**	**NE**	**PNW**	**RM**	**SO**
			East	West						
132	Virginia pine	*Pinus virginiana*	3	24	1	X	X			X
133	singleleaf pinyon	*Pinus monophylla*	23	23	1			X	X	X
134	border pinyon	*Pinus discolor*	23	23	1				X	X
135	Arizona pine	*Pinus arizonica*	9	11	1				X	X
136	Austrian pine	*Pinus nigra*	9	24	1	X	X		X	X
137	Washoe pine	*Pinus washoensis*	9	24	1			X	X	
138	four-leaf or Parry pinyon pine	*Pinus quadrifolia*	23	23	1			X		
139	Torrey pine	*Pinus torreyana*	9	24	1			X		
140	Mexican pinyon pine	*Pinus cembroides*	23	23	1				X	X
141	Papershell pinyon pine	*Pinus remota*	23	23	1					X
142	Great Basin bristlecone pine	*Pinus longaeva*	9	24	1			X	X	
143	Arizona pinyon pine	*Pinus monophylla* var. *fallax*	23	23	1				X	X
144	Honduras pine	*Pinus elliottii* var. *elliottii*	9	24	1					X
200	Douglas-fir spp.	*Pseudotsuga* spp.	9	10	2	X		X		
201	bigcone Douglas-fir	*Pseudotsuga macrocarpa*	9	10	2			X		
202	Douglas-fir	*Pseudotsuga menziesii*	9	10	2	X	X	X	X	X
211	redwood	*Sequoia sempervirens*	9	16	2			X		
212	giant sequoia	*Sequoiadendron giganteum*	9	24	2			X		
220	baldcypress spp.	*Taxodium* spp.	9	24	2	X	X			X
221	baldcypress	*Taxodium distichum*	8	24	2	X	X			X
222	pondcypress	*Taxodium ascendens*	8	24	2		X			X
223	Montezuma baldcypress	*Taxodium mucronatum*	8	24	2					X
230	yew spp.	*Taxus* spp.	9	24	2	X		X		
231	Pacific yew	*Taxus brevifolia*	9	24	2			X	X	
232	Florida yew	*Taxus floridana*	9	24	2					X
240	thuja spp.	*Thuja* spp.	9	24	2	X		X		
241	northern white-cedar	*Thuja occidentalis*	9	24	2	X	X			X
242	western redcedar	*Thuja plicata*	9	22	2			X	X	
250	torreya (nutmeg) spp.	*Torreya* spp.	9	24	2			X		
251	California torreya	*Torreya californica*	9	24	2			X		
252	Florida torreya (nutmeg)	*Torreya taxifolia*	9	24	2					X
260	hemlock spp.	*Tsuga* spp.	7	24	2	X	X			X
261	eastern hemlock	*Tsuga canadensis*	7	24	2	X	X			X
262	Carolina hemlock	*Tsuga caroliniana*	7	24	2					X
263	western hemlock	*Tsuga heterophylla*	9	13	2			X	X	
264	mountain hemlock	*Tsuga mertensiana*	9	24	2			X	X	
299	Unknown dead conifer	Tree evergreen	9	24	2	X	X	X		X
300	acacia spp.	*Acacia* spp.	48	48	3			X		
303	sweet acacia	*Acacia farnesiana*	48	48	3					X
304	catclaw acacia	*Acacia greggii*	48	48	3			X		X
310	maple spp.	*Acer* spp.	31	47	4	X	X			X
311	Florida maple	*Acer barbatum*	31	47	4					X
312	bigleaf maple	*Acer macrophyllum*	43	47	3			X		X
313	boxelder	*Acer negundo*	41	47	3	X	X	X	X	X

						Occurrence by FIA work unit				
SPCD	**COMMON_NAME**	**Scientific Name**	**SPGRPCD**		**MAJGRP**	**NC**	**NE**	**PNW**	**RM**	**SO**
			East	West						
314	black maple	*Acer nigrum*	31	47	4	X	X			X
315	striped maple	*Acer pensylvanicum*	43	47	3	X	X			X
316	red maple	*Acer rubrum*	32	47	3	X	X			X
317	silver maple	*Acer saccharinum*	32	47	3	X	X			X
318	sugar maple	*Acer saccharum*	31	47	4	X	X			X
319	mountain maple	*Acer spicatum*	43	47	4	X	X			X
320	Norway maple	*Acer platanoides*	31	47	4	X	X	X		X
321	Rocky Mountain maple	*Acer glabrum*	48	48	4	X		X		X
322	bigtooth maple	*Acer grandidentatum*	48	48	4			X	X	X
323	chalk maple	*Acer leucoderme*	31	47	4					X
330	buckeye, horsechestnut spp.	*Aesculus* spp.	41	47	3	X	X	X		X
331	Ohio buckeye	*Aesculus glabra*	41	47	3	X	X			X
332	yellow buckeye	*Aesculus flava*	43	47	3	X	X			X
333	California buckeye	*Aesculus californica*	41	47	3			X		
334	Texas buckeye	*Aesculus glabra* var. *arguta*	41	47	3	X				X
336	red buckeye	*Aesculus pavia*	43	47	3	X	X			X
337	painted buckeye	*Aesculus sylvatica*	41	47	3					X
341	ailanthus	*Ailanthus altissima*	43	47	4	X	X	X		X
345	mimosa, silktree	*Albizia julibrissin*	43	47	3	X	X			X
350	alder spp.	*Alnus* spp.	41	47	3	X		X		X
351	red alder	*Alnus rubra*	43	45	3			X	X	X
352	white alder	*Alnus rhombifolia*	43	47	3			X	X	
353	Arizona alder	*Alnus oblongifolia*	43	47	3			X	X	X
355	European alder	*Alnus glutinosa*	43	47	3	X	X			X
356	serviceberry spp.	*Amelanchier* spp.	43	47	4	X	X			X
357	common serviceberry	*Amelanchier arborea*	43	47	4	X	X			
358	roundleaf serviceberry	*Amelanchier sanguinea*	43	47	4	X	X			
360	madrone spp.	*Arbutus* spp.	43	47	4			X		X
361	Pacific madrone	*Arbutus menziesii*	43	47	4			X	X	
362	Arizona madrone	*Arbutus arizonica*	43	47	4			X	X	X
363	Texas madrone	*Arbutus xalapensis*	48	48	4					X
367	pawpaw	*Asimina triloba*	43	47	3	X	X			X
370	birch spp.	*Betula* spp.	41	47	4	X	X			X
371	yellow birch	*Betula alleghaniensis*	30	47	4	X	X			X
372	sweet birch	*Betula lenta*	42	47	4	X	X			X
373	river birch	*Betula nigra*	41	47	3	X	X			X
374	water birch	*Betula occidentalis*	41	47	3	X		X	X	X
375	paper birch	*Betula papyrifera*	41	47	3	X	X	X	X	X
377	Virginia roundleaf birch	*Betula uber*	41	47	3					X
378	NW paper birch	*Betula x utahensis*	43	47	3			X		
379	gray birch	*Betula populifolia*	41	47	3	X	X			X
381	chittamwood, gum bumelia	*Sideroxylon lanuginosum* ssp. *lanuginosum*	43	47	4	X				X
391	American hornbeam	*Carpinus caroliniana*	43	47	4	X	X			X
400	hickory spp.	*Carya* spp.	29	47	4	X	X			X
401	water hickory	*Carya aquatica*	29	47	4	X				X

						Occurrence by FIA work unit				
SPCD	**COMMON_NAME**	**Scientific Name**	**SPGRPCD**		**MAJGRP**	**NC**	**NE**	**PNW**	**RM**	**SO**
			East	West						
402	bitternut hickory	*Carya cordiformis*	29	47	4	X	X			X
403	pignut hickory	*Carya glabra*	29	47	4	X	X			X
404	pecan	*Carya illinoinensis*	29	47	4	X	X		X	X
405	shellbark hickory	*Carya laciniosa*	29	47	4	X	X			X
406	nutmeg hickory	*Carya myristiciformis*	29	47	4					X
407	shagbark hickory	*Carya ovata*	29	47	4	X	X			X
408	black hickory	*Carya texana*	29	47	4	X				X
409	mockernut hickory	*Carya alba*	29	47	4	X	X			X
410	sand hickory	*Carya pallida*	29	47	4	X	X			X
411	scrub hickory	*Carya floridana*	29	47	4					X
412	red hickory	*Carya ovalis*	29	47	4	X	X			X
413	southern shagbark hickory	*Carya carolinae-septentrionalis*	29	47	4					X
420	chestnut spp.	*Castanea* spp.	43	47	3	X	X			X
421	American chestnut	*Castanea dentata*	43	47	3	X	X			X
422	Allegheny chinkapin	*Castanea pumila*	43	47	3	X	X			X
423	Ozark chinkapin	*Castanea pumila* var. *ozarkensis*	43	47	3	X				X
424	Chinese chestnut	*Castanea mollissima*	43	47	3	X	X			X
431	giant chinkapin	*Chrysolepis chrysophylla* var. *chrysophylla*	43	47	3			X		
450	catalpa spp.	*Catalpa* spp.	42	47	4	X	X			X
451	southern catalpa	*Catalpa bignonioides*	43	47	4	X				X
452	northern catalpa	*Catalpa speciosa*	41	47	3	X	X			X
460	hackberry spp.	*Celtis* spp.	41	47	3	X	X			X
461	sugarberry	*Celtis laevigata*	41	47	3	X	X		X	X
462	hackberry	*Celtis occidentalis*	41	47	3	X	X		X	X
463	netleaf hackberry	*Celtis laevigata* var. *reticulata*	41	47	3	X				X
471	eastern redbud	*Cercis canadensis*	43	47	3	X	X			X
475	mountain-mahogany	*Cercocarpus ledifolius*	48	48	4			X	X	X
481	yellowwood	*Cladrastis kentukea*	43	47	4	X	X			X
490	dogwood spp.	*Cornus* spp.	43	47	4	X	X	X		
491	flowering dogwood	*Cornus florida*	42	47	4	X	X			X
492	Pacific dogwood	*Cornus nuttallii*	43	47	4			X	X	X
500	hawthorn spp.	*Crataegus* spp.	43	47	4	X	X	X		X
501	cockspur hawthorn	*Crataegus crus-galli*	43	47	4	X	X			X
502	downy hawthorn	*Crataegus mollis*	43	47	4	X	X			X
503	Brainerd's hawthorn	*Crataegus brainerdii*	43	47	4	X	X			X
504	pear hawthorn	*Crataegus calpodendron*	43	47	4	X	X			X
505	fireberry hawthorn	*Crataegus chrysocarpa*	43	47	4	X	X			X
506	broadleaf hawthorn	*Crataegus dilatata*	43	47	4	X	X			X
507	fanleaf hawthorn	*Crataegus flabellata*	43	47	4	X	X			X
508	oneseed hawthorn	*Crataegus monogyna*	43	47	4	X	X			X
509	scarlet hawthorn	*Crataegus pedicellata*	43	47	4	X	X			X
510	eucalyptus spp.	*Eucalyptus* spp.	42	47	4			X		X
511	Tasmanian bluegum	*Eucalyptus globulus*	43	47	4			X		
512	river redgum	*Eucalyptus camaldulensis*	43	47	4			X		
513	grand eucalyptus	*Eucalyptus grandis*	43	47	4			X		X

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			East	West						
514	swampmahogany	*Eucalyptus robusta*	43	47	4					X
520	persimmon spp.	*Diospyros* spp.	43	47	4	X	X			X
521	common persimmon	*Diospyros virginiana*	42	47	4	X	X			X
522	Texas persimmon	*Diospyros texana*	43	47	4					X
523	Anacua knockaway	*Ehretia anacua*	48	48	3					X
531	American beech	*Fagus grandifolia*	33	47	4	X	X			X
540	ash spp.	*Fraxinus* spp.	36	47	3	X	X	X		X
541	white ash	*Fraxinus americana*	36	47	4	X	X			X
542	Oregon ash	*Fraxinus latifolia*	43	47	4			X		
543	black ash	*Fraxinus nigra*	36	47	3	X	X			X
544	green ash	*Fraxinus pennsylvanica*	36	47	4	X	X		X	X
545	pumpkin ash	*Fraxinus profunda*	36	47	3	X	X			X
546	blue ash	*Fraxinus quadrangulata*	36	47	4	X	X			X
547	velvet ash	*Fraxinus velutina*	43	47	4			X	X	X
548	Carolina ash	*Fraxinus caroliniana*	36	47	4					X
549	Texas ash	*Fraxinus texensis*	36	47	3					X
550	honeylocust spp.	*Gleditsia* spp.	42	47	4	X	X	X		X
551	waterlocust	*Gleditsia aquatica*	42	47	4	X				X
552	honeylocust	*Gleditsia triacanthos*	42	47	4	X	X		X	X
555	loblolly-bay	*Gordonia lasianthus*	41	47	3					X
561	ginkgo	*Ginkgo biloba*	43	47	3	X	X	X		X
571	Kentucky coffeetree	*Gymnocladus dioicus*	42	47	4	X	X			X
580	silverbell spp.	*Halesia* spp.	43	47	3	X	X			X
581	Carolina silverbell	*Halesia carolina*	41	47	3					X
582	two-wing silverbell	*Halesia diptera*	41	47	3					X
583	little silverbell	*Halesia parviflora*	41	47	3					X
591	American holly	*Ilex opaca*	42	47	4	X	X	X		X
600	walnut spp.	*Juglans* spp.	41	47	4	X	X	X		X
601	butternut	*Juglans cinerea*	41	47	3	X	X			X
602	black walnut	*Juglans nigra*	40	47	4	X	X	X	X	X
603	N California black walnut	*Juglans hindsii*	43	47	4			X		
604	S California black walnut	*Juglans californica*	43	47	4			X		
605	Texas walnut	*Juglans microcarpa*	41	47	4	X				X
606	Arizona walnut	*Juglans major*	43	47	4			X	X	X
611	sweetgum	*Liquidambar styraciflua*	34	47	3	X	X	X		X
621	yellow-poplar	*Liriodendron tulipifera*	39	47	3	X	X			X
631	tanoak	*Lithocarpus densiflorus*	43	47	4			X		
641	Osage-orange	*Maclura pomifera*	43	47	4	X	X			X
650	magnolia spp.	*Magnolia* spp.	41	47	3	X	X			X
651	cucumbertree	*Magnolia acuminata*	41	47	3	X	X			X
652	southern magnolia	*Magnolia grandiflora*	41	47	3		X			X
653	sweetbay	*Magnolia virginiana*	43	47	3		X			X
654	bigleaf magnolia	*Magnolia macrophylla*	43	47	4		X			X
655	mountain or Fraser magnolia	*Magnolia fraseri*	41	47	3		X			X
657	pyramid magnolia	*Magnolia pyramidata*	41	47	3					X

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			East	West						
658	umbrella magnolia	*Magnolia tripetala*	41	47	3	X	X			X
660	apple spp.	*Malus* spp.	43	47	4	X	X	X		X
661	Oregon crab apple	*Malus fusca*	43	47	4			X		
662	southern crab apple	*Malus angustifolia*	43	47	4	X	X			X
663	sweet crab apple	*Malus coronaria*	43	47	4	X	X			X
664	prairie crab apple	*Malus ioensis*	43	47	4	X				X
680	mulberry spp.	*Morus* spp.	42	47	4	X	X			X
681	white mulberry	*Morus alba*	42	47	4	X	X			X
682	red mulberry	*Morus rubra*	42	47	4	X	X			X
683	Texas mulberry	*Morus microphylla*	42	47	4					X
684	black mulberry	*Morus nigra*	43	47	4		X			X
690	tupelo spp.	*Nyssa* spp.	35	47	3	X	X			X
691	water tupelo	*Nyssa aquatica*	35	47	3	X				X
692	Ogeechee tupelo	*Nyssa ogeche*	43	47	4					X
693	blackgum	*Nyssa sylvatica*	35	47	3	X	X			X
694	swamp tupelo	*Nyssa biflora*	35	47	3	X	X			X
701	eastern hophornbeam	*Ostrya virginiana*	43	47	4	X	X			X
711	sourwood	*Oxydendrum arboreum*	43	47	4	X	X			X
712	paulownia	*Paulownia tomentosa*	41	47	3	X	X			X
720	bay spp.	*Persea* spp.	43	47	3		X			X
721	redbay	*Persea borbonia*	41	47	3					X
722	water-elm, planertree	*Planera aquatica*	43	47	3	X				X
729	sycamore spp.	*Platanus* spp.	41	47	3	X	X	X		X
730	California sycamore	*Platanus racemosa*	43	47	3			X		
731	American sycamore	*Platanus occidentalis*	41	47	3	X	X	X		X
732	Arizona sycamore	*Platanus wrightii*	41	47	3			X	X	X
740	cottonwood & poplar spp.	*Populus* spp.	37	44	3	X	X			X
741	balsam poplar	*Populus balsamifera*	37	44	3	X	X		X	X
742	eastern cottonwood	*Populus deltoides*	37	44	3	X	X		X	X
743	bigtooth aspen	*Populus grandidentata*	37	44	3	X	X			X
744	swamp cottonwood	*Populus heterophylla*	37	44	3	X	X			X
745	plains cottonwood	*Populus deltoides* ssp. *monilifera*	37	44	3	X			X	X
746	quaking aspen	*Populus tremuloides*	37	44	3	X	X	X	X	X
747	black cottonwood	*Populus balsamifera* ssp. *trichocarpa*	37	44	4	X		X	X	
748	Fremont cottonwood	*Populus fremontii*	37	44	4			X	X	X
749	narrowleaf cottonwood	*Populus angustifolia*	37	44	3	X			X	X
752	silver poplar	*Populus alba*	37	44	3	X	X			X
753	Lombardy poplar	*Populus nigra*	37	44	3	X	X	X		X
755	mesquite spp.	*Prosopis* spp.	48	48	4					X
756	honey mesquite	*Prosopis glandulosa*	48	48	4			X	X	X
757	velvet mesquite	*Prosopis velutina*	48	48	4			X	X	X
758	screwbean mesquite	*Prosopis pubescens*	48	48	4			X	X	X
760	cherry and plum spp.	*Prunus* spp.	43	47	4	X	X	X		X
761	pin cherry	*Prunus pensylvanica*	43	47	3	X	X			X
762	black cherry	*Prunus serotina*	41	47	3	X	X			X

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			East	West						
763	chokecherry	*Prunus virginiana*	43	47	4	X	X	X		X
764	peach	*Prunus persica*	43	47	3	X	X			X
765	Canada plum	*Prunus nigra*	43	47	4	X	X			X
766	American plum	*Prunus americana*	43	47	4	X	X			X
768	bitter cherry	*Prunus emarginata*	43	47	4			X		
769	Allegheny plum	*Prunus alleghaniensis*	43	47	3	X	X			X
770	Chickasaw plum	*Prunus angustifolia*	43	47	3	X	X			X
771	sweet cherry, domesticated	*Prunus avium*	43	47	3	X	X	X		X
772	sour cherry, domesticated	*Prunus cerasus*	43	47	3	X	X	X		
773	European plum, domesticated	*Prunus domestica*	43	47	3	X	X	X		
774	Mahaleb cherry, domesticated	*Prunus mahaleb*	43	47	3	X	X	X		
800	oak spp	*Quercus* spp.	42	48	4	X	X	X		X
801	California live oak	*Quercus agrifolia*	43	46	4			X		
802	white oak	*Quercus alba*	25	47	4	X	X			X
803	Arizona white oak	*Quercus arizonica*	48	48	4				X	X
804	swamp white oak	*Quercus bicolor*	25	47	4	X	X			X
805	canyon live oak	*Quercus chrysolepis*	43	46	4			X		
806	scarlet oak	*Quercus coccinea*	28	47	4	X	X			X
807	blue oak	*Quercus douglasii*	43	46	4			X		
808	Durand oak	*Quercus sinuata* var. *sinuata*	25	47	4					X
809	northern pin oak	*Quercus ellipsoidalis*	28	47	4	X	X			X
810	Emory oak	*Quercus emoryi*	48	48	4				X	X
811	Engelmann oak	*Quercus engelmannii*	43	46	4			X		
812	southern red oak	*Quercus falcata*	28	47	4	X	X			X
813	cherrybark oak	*Quercus pagoda*	26	47	4	X	X			X
814	Gambel oak	*Quercus gambelii*	48	48	4				X	X
815	Oregon white oak	*Quercus garryana*	43	46	4			X		
816	scrub oak	*Quercus ilicifolia*	43	47	4		X			X
817	shingle oak	*Quercus imbricaria*	28	47	4	X	X			X
818	California black oak	*Quercus kelloggii*	43	46	4			X		
819	turkey oak	*Quercus laevis*	43	47	4					X
820	laurel oak	*Quercus laurifolia*	28	47	4		X			X
821	California white oak	*Quercus lobata*	43	46	4			X		
822	overcup oak	*Quercus lyrata*	27	47	4	X	X			X
823	bur oak	*Quercus macrocarpa*	25	47	4	X	X		X	X
824	blackjack oak	*Quercus marilandica*	28	47	4	X	X			X
825	swamp chestnut oak	*Quercus michauxii*	25	47	4	X	X			X
826	chinkapin oak	*Quercus muehlenbergii*	25	47	4	X	X	X	X	X
827	water oak	*Quercus nigra*	28	47	4	X	X			X
828	Texas red oak	*Quercus texana*	28	47	4	X				X
829	Mexican blue oak	*Quercus oblongifolia*	48	48	4				X	X
830	pin oak	*Quercus palustris*	28	47	4	X	X			X
831	willow oak	*Quercus phellos*	28	47	4	X	X			X
832	chestnut oak	*Quercus prinus*	27	47	4	X	X			X

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			East	West						
833	northern red oak	*Quercus rubra*	26	47	4	X	X			X
834	Shumard oak	*Quercus shumardii*	26	47	4	X	X			X
835	post oak	*Quercus stellata*	27	47	4	X	X			X
836	Delta post oak	*Quercus similis*	27	47	4					X
837	black oak	*Quercus velutina*	28	47	4	X	X			X
838	live oak	*Quercus virginiana*	27	47	4					X
839	interior live oak	*Quercus wislizeni*	43	46	4			X		
840	dwarf post oak	*Quercus margarettiae*	27	47	4	X				X
841	dwarf live oak	*Quercus minima*	27	47	4					X
842	bluejack oak	*Quercus incana*	43	47	4					X
843	silverleaf oak	*Quercus hypoleucoides*	48	48	4				X	X
844	Oglethorpe oak	*Quercus oglethorpensis*	27	47	4					X
845	dwarf chinkapin oak	*Quercus prinoides*	43	47	4	X	X			X
846	gray oak	*Quercus grisea*	48	48	4				X	X
847	netleaf oak	*Quercus rugosa*	48	48	4				X	X
851	Chisos oak	*Quercus graciliformis*	26	47	4					X
8511	Graves oak	*Quercus gravesii*	26	47	4					X
8512	Mexican white oak	*Quercus polymorpha*	26	47	4					X
8513	Buckley oak	*Quercus buckleyi*	26	47	4					X
8514	Lacey oak	*Quercus laceyi*	26	47	4					X
852	sea torchwood	*Amyris elemifera*	43	47	3					X
853	pond-apple	*Annona glabra*	43	47	3					X
854	gumbo limbo	*Bursera simaruba*	43	47	3					X
855	sheoak spp.	*Casuarina* spp.	43	47	3					X
856	gray sheoak	*Casuarina glauca*	43	47	3					X
857	belah	*Casuarina lepidophloia*	43	47	3					X
858	camphortree	*Cinnamomum camphora*	43	47	3					X
859	Florida fiddlewood	*Citharexylum fruticosum*	43	47	3					X
860	citrus spp.	*Citrus* spp.	43	47	3					X
863	tietongue, pigeon-plum	*Coccoloba diversifolia*	43	47	3					X
864	soldierwood	*Colubrina elliptica*	43	47	3					X
865	largeleaf geigertree	*Cordia sebestena*	43	47	3					X
866	carrotwood	*Cupaniopsis anacardioides*	43	47	3					X
867	Bluewood	*Condalia hookeri*	48	48	4					X
868	Blackbead ebony	*Ebenopsis ebano*	42	47	4					X
869	Great leucaene	*Leucaena pulverulenta*	43	47	3					X
870	Texas sophora	*Sophora affinis*	42	47	4					X
873	red stopper	*Eugenia rhombea*	43	47	3					X
874	butterbough, inkwood	*Exothea paniculata*	43	47	3					X
876	Florida strangler fig	*Ficus aurea*	43	47	3					X
877	wild banyantree, shortleaf fig	*Ficus citrifolia*	43	47	3					X
882	beeftree, longleaf blolly	*Guapira discolor*	43	47	3					X
883	manchineel	*Hippomane mancinella*	43	47	3					X
884	false tamarind	*Lysiloma latisiliquum*	43	47	3					X
885	mango	*Mangifera indica*	43	47	3					X

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			East	West						
886	Florida poisontree	*Metopium toxiferum*	43	47	3					X
887	fishpoison tree	*Piscidia piscipula*	43	47	3					X
888	octopus tree, schefflera	*Schefflera actinophylla*	43	47	3					X
890	false mastic	*Sideroxylon foetidissimum*	43	47	3					X
891	white bully, willow bustic	*Sideroxylon salicifolium*	43	47	3					X
895	paradisetree	*Simarouba glauca*	43	47	3					X
896	Java plum	*Syzygium cumini*	43	47	3					X
897	tamarind	*Tamarindus indica*	43	47	3					X
901	black locust	*Robinia pseudoacacia*	42	47	4	X	X	X	X	X
902	New Mexico locust	*Robinia neomexicana*	48	48	4					X
906	Everglades palm, paurotis-palm	*Acoelorraphe wrightii*	43	47	3					X
907	Florida silver palm	*Coccothrinax argentata*	43	47	3					X
908	coconut palm	*Cocos nucifera*	43	47	3					X
909	royal palm spp.	*Roystonea* spp.	43	47	3					X
911	Mexican palmetto	*Sabal mexicana*	41	47	3					X
912	cabbage palmetto	*Sabal palmetto*	43	47	3					X
913	key thatch palm	*Thrinax morrisii*	43	47	3					X
914	Florida thatch palm	*Thrinax radiata*	43	47	3					X
915	other palms	Family Arecaceae not listed above	43	47	3					X
919	western soapberry	*Sapindus saponaria* var. *drummondii*	43	47	4	X				X
920	willow spp.	*Salix* spp.	43	47	3	X	X	X		X
921	peachleaf willow	*Salix amygdaloides*	43	47	3	X	X			X
922	black willow	*Salix nigra*	41	47	3	X	X	X		X
923	Bebb willow	*Salix bebbiana*	43	47	3	X	X			X
924	Bonpland willow	*Salix bonplandiana*	41	47	3					X
925	coastal plain willow	*Salix caroliniana*	43	47	3	X	X			X
926	balsam willow	*Salix pyrifolia*	43	47	3	X	X	X		
927	white willow	*Salix alba*	41	47	3	X	X			X
928	Scouler's willow	*Salix scouleriana*	41	47	3	X		X		
929	weeping willow	*Salix sepulcralis*	41	47	3	X	X			X
931	sassafras	*Sassafras albidum*	41	47	3	X	X			X
934	mountain-ash spp.	*Sorbus* spp.	43	47	4	X	X			X
935	American mountain-ash	*Sorbus americana*	43	47	4	X	X			X
936	European mountain-ash	*Sorbus aucuparia*	43	47	4		X			X
937	northern mountain-ash	*Sorbus decora*	43	47	4	X	X			
940	West Indian mahogany	*Swietenia mahagoni*	43	47	4					X
950	basswood spp.	*Tilia* spp.	38	47	3	X	X			X
951	American basswood	*Tilia americana*	38	47	3	X	X			X
952	white basswood	*Tilia americana* var. *heterophylla*	38	47	3	X	X			X
953	Carolina basswood	*Tilia americana* var. *caroliniana*	38	47	3	X				X
970	elm spp.	*Ulmus* spp.	41	47	3	X	X			X
971	winged elm	*Ulmus alata*	41	47	4	X	X			X
972	American elm	*Ulmus americana*	41	47	3	X	X		X	X
973	cedar elm	*Ulmus crassifolia*	41	47	3	X				X

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			East	West						
974	Siberian elm	*Ulmus pumila*	41	47	3	X	X		X	X
975	slippery elm	*Ulmus rubra*	41	47	3	X	X			X
976	September elm	*Ulmus serotina*	41	47	3	X				X
977	rock elm	*Ulmus thomasii*	42	47	4	X	X			X
981	California-laurel	*Umbellularia californica*	43	47	4			X		
982	Joshua tree	*Yucca brevifolia*	43	47	3			X		
986	black-mangrove	*Avicennia germinans*	43	47	4					X
987	buttonwood-mangrove	*Conocarpus erectus*	43	47	4					X
988	white-mangrove	*Laguncularia racemosa*	43	47	4					X
989	American mangrove	*Rhizophora mangle*	43	47	4					X
990	desert ironwood	*Olneya tesota*	48	48	4			X		
991	saltcedar	*Tamarix* spp.	43	47	3	X		X		
992	melaleuca	*Melaleuca quinquenervia*	41	47	3					X
993	chinaberry	*Melia azedarach*	43	47	4	X				X
994	Chinese tallowtree	*Triadica sebifera*	43	47	4					X
995	tungoil tree	*Vernicia fordii*	43	47	4					X
996	smoketree	*Cotinus obovatus*	43	47	4	X				X
997	Russian-olive	*Elaeagnus angustifolia*	43	47	3	X	X	X		X
998	Unknown dead hardwood	Tree broadleaf	43	47	3	X	X	X		X
999	unknown live tree	Tree unknown	43	47	3	X	X	X		X

Appendix G. Tree Species Group Codes

Species group name	Code
Western softwood species groups	
Douglas-fir	10
Ponderosa and Jeffrey pines	11
True fir	12
Western hemlock	13
Sugar pine	14
Western white pine	15
Redwood	16
Sitka spruce	17
Engelmann and other spruces	18
Western larch	19
Incense-cedar	20
Lodgepole pine	21
Western redcedar	22
Woodland softwoods	23
Other western softwoods	24
Western juniper	25
Western hardwood species groups	
Cottonwood and aspen	44
Red alder	45
Oak	46
Other western hardwoods	47
Woodland hardwoods	48
Eastern softwood species groups	
Longleaf and slash pines	1
Loblolly and shortleaf pines	2
Other yellow pines	3
Eastern white and red pines	4
Jack pine	5
Spruce and balsam fir	6
Eastern hemlock	7
Cypress	8
Other eastern softwoods	9
Eastern hardwood species groups	
Select white oaks	25
Select red oaks	26
Other white oaks	27
Other red oaks	28
Hickory	29
Yellow birch	30
Hard maple	31
Soft maple	32
Beech	33
Sweetgum	34
Tupelo and blackgum	35
Ash	36
Cottonwood and aspen	37
Basswood	38
Yellow-poplar	39
Black walnut	40
Other eastern soft hardwoods	41
Other eastern hard hardwoods	42
Eastern noncommercial hardwoods	43
Tropical species groups	
Tropical and subtropical pines	51
Other tropical and subtropical softwoods	52
Tropical and subtropical palms	53
Tropical and subtropical hardwoods	54

Appendix H. Damage Agent codes for PNW

Damage Agent is a 2-digit code with values 01 to 91. For Agent and Severity 1, 2 and 3: the agent and severity codes indicate the type of agents that were present on a tree and describe their severity. Several damaging agents are automatically of highest importance and should be coded before any other agents; these agents are grouped as Class I Agents. Class I insects, diseases, or physical injuries can seriously affect vegetation. Failure to account for these agents can result in large differences in predicted outcomes for tree growth, survival, vegetative composition and structure. Class II agents can be important in local situations; recording their incidence and severity provides valuable information for those situations. Class II agents are recorded when present but only after all Class I agents.

Agents and their severity ratings are grouped by broad category. Each category has a general agent and specific agents listed. The general codes should be used if there is any question as to the identity of the specific damaging agent.

Class I Agents

	Agents		Severity	
	Code	**Agent**	**Code**	**Severity**
Bark beetles:				
	01	General /other bark beetle	1	Unsuccessful current attack
	02	Mountain pine beetle	2	Successful current attack
	03	Douglas-fir beetle	3	Last year's successful attack
	04	Spruce beetle	4	Older dead
	05	Western pine beetle	5	Top kill
	06	Pine engraver beetle		
	07	Fir engraver beetle		
	08	Silver fir beetle		
	09	Red turpentine beetle		
	26	Jeffrey pine beetle		
	Code	**Agent**	**Code**	**Severity**
Defoliators:			0	No detectable defoliation
	10	General/other	1	Up to 33% of foliage (old and new missing/affected
	11	Western blackheaded budworm		
	12	Pine butterfly	2	34 to 66% of foliage missing/affected
	13	Douglas-fir tussock moth		
	14	Larch casebearer	3	67 to 100% of foliage missing/affected
	15	Western spruce or Modoc budworm		
	16	Western hemlock looper		
	17	Sawflies		
	18	Needles and sheath miners		
	19	Gypsy moth		

	Code	Agent	Code	Severity
Root diseases:				
	60	General/other	1	Tree is a live tally tree within 30 ft of a tree or stump that has a root disease to which the tally tree is susceptible
	61	Annosus root disease		
	62	Armillaria root disease		
	63	Black stain root disease		
	65	Laminated root rot		
	66	Port-Orford-cedar root disease	2	Live tally tree with signs or symptoms diagnostic for root disease such as characteristic decay, stain, ectotrophic mycelia, mycelial fans, conks or excessive resin flow at the root collar. No visible crown deterioration.
			3	Live tally tree with signs or symptoms diagnostic for root disease such as characteristic decay, stain, ectotrophic mycelia, mycelial fans, conks, or excessive resin flow at the root collar. Visible crown deterioration such as thinning chlorotic foliage, reduced terminal growth, and/or stress cones.

	Code	Agent	Code	Severity
White pine blister rust:				
	36	White pine blister rust	1	Branch infections located more than 2.0 ft from tree bole.
			2	Branch infections located 0.5 to 2.0 ft from bole.
			3	Bole infections present, Or: branch infections within 0.5 ft of bole

	Code	Agent	Code	Severity
Sudden oak death (tanoak, coast live oak, black oak):				
	1	Sudden Oak Death symptoms	1	Bleeding present on bole
			2	Bleeding present on bole and adjacent mortality present
			3	Laboratory confirmed Sudden Oak Death

Class II Agents

	Agents		Severity	
	Code	**Agent**	**Code**	**Severity**
Other insects:				
	20	General	1	Bottlebrush or shortened leaders, 0-2 forks on the tree's stem, Or: less than 20% of the branches affected, Or: <50% of the bole has visible larval galleries.
	21	Shoot moths		
	22	Weevils		
	23	Wood borers		
	24	Balsam wooly adelgid (aphid)		
	25	Sitka spruce terminal weevil		
			2	3 or more forks on the tree's bole, Or: 20% or more of the branches are affected, Or: the terminal leader is dead, Or: ≥50% of the bole as visible larval galleries.
Stem-branch cankers:	**Code**	**Agent**	**Code**	**Severity**
	33	Diplodia blight	1	Branch infections present. <50% of the crown affected
	40	General/other	2	Branch infections present. ≥50% of the crown affected, Or: any infection on the bole.
	41	Western gall rust (*Pinus ponderosa, Pinus contorta*)		
	42	Commandra blister rust (*Pinus ponderosa*)		
	43	Stalactiform rust (*Pinus contorta*)		
	44	Atropellis canker (*Pinus spp.)*		
	45	Cytospoa or Phomopsis (*Pseudotsuga menziesii, Abies* spp.)		
Pitch canker:	**Code**	**Agent**	**Code**	**Severity**
	32	Pitch canker (CA *Pinus* spp.)	1	no bole canker + < 10 infected branch tips
			2	no bole canker + ≥ 10 infected branch tips
			3	1 or more bole cankers + < 10 infected branch tips
			4	1 or more bole cankers + ≥ 10 infected branch tips
	Code	**Agent**	**Code**	**Severity**
Stem decays:	46	General/other	1	1 conk on the stem or present at ground level
	47	Red ring rot (*Phellinus pini*)	2	2 or more conks separated by < 16 ft on bole
	48	Indian paint rot (*Echinodontium tinctorium*)	3	2 or more conks separated by ≥ 16 ft on bole
	49	Brown cubical rot (*Phaeolus schweinitzii)*	4	No conks. Visible decay in the interior of the bole

Class II Agents

	Agents		Severity	
	Code	**Agent**	**Code**	**Severity**
Special agents:				
	50	Suppression	No severity rating	
	51	Excessively deformed sapling		
	Code	**Agent**	**Code**	**Severity**
Foliar pathogens:				
	55	General/other	1	<20% of foliage affected, Or: <20% of crown in brooms
	56	Rhabdocline (only on *Pseudotsuga menziesii*)		
	57	Elytroderma (only on *Pinus ponderosa*)	2	≥20% of foliage affected, Or: >20% of crown in brooms.
	58	Broom rusts		
	59	Swiss needle cast (only on *Pseudotsuga menziesii*)		
	Code	**Agent**	**Code**	**Severity**
Animal agents:				
	70	Animal; general/unknown	1	<20% of the crown is affected. Bole damage is restricted to less than half of circumference.
	71	Mountain beaver		
	72	Livestock		
	73	Deer or elk	2	≥20% of the crown is affected. Bole damage to half or more of circumference.
	74	Porcupines		
	75	Pocket gophers, squirrels, mice, voles, rabbits, hares		
	76	Beaver		
	77	Bear		
	78	Human (not logging)		
	Code	**Agent**	**Code**	**Severity**
Weather agents:				
	80	Weather; general/unknown	1	<20% of the crown is affected.
	81	Windthrow or wind breakage	2	≥20% of the crown is affected, Or: any damage to the bole.
	82	Snow/ice bending or breakage		
	83	Frost damage on shoots		
	84	Winter desiccation		
	85	Drought/moisture deficiency		
	86	Sun scald		
	87	Lightning		

	Code	Agent	Code	Severity
Physical injury:				
	90	Other; general/unknown	1	<20% of the crown is affected.
	91	Logging damage	2	≥20% of the crown is affected, Or: any damage to the bole.
	92	Fire; basal scars or scorch		
	93	Improper planting		
	94	Air pollution or other chemical damage		

	Code	Agent	Code	Severity
Physical defect:				
	95	Unspecified physical defect	0	Severity is not rated
	96	Broken/missing top		
	97	Dead top		
	98	Forks and crooks (only if caused by old top out or dead top)		
	99	Checks/bole cracks		

Appendix I. FIA Inventories by State, Year, and Type

State code	State name	Initiation of annual inventory
2	Alaska	2004
6	California	2001
41	Oregon	2001
53	Washington	2002

Appendix J. Biomass Estimation in the FIADB

In previous versions of the FIADB, a variety of regional methods were used to estimate tree biomass for live and dead trees in the TREE table. In FIADB 4.0, a new nationally consistent method of estimating tree biomass has been implemented. This new approach, called the component ratio method (CRM) (Heath and others 2009), involves calculating the dry weight of individual components before estimating the total aboveground or belowground biomass. The CRM approach is based on:

- converting the sound volume of wood (VOLCFSND) in the merchantable bole to biomass using a compiled set of wood specific gravities (Miles and Smith 2009) (see REF_SPECIES table for values)
- calculating the biomass of bark on the merchantable bole using a compiled set of percent bark estimates and bark specific gravities (Miles and Smith 2009) (see REF_SPECIES table for values)
- calculating the biomass of the entire tree (total aboveground biomass), merchantable bole (including bark), and belowground biomass, using equations from Jenkins and others (2003)
- calculating the volume of the stump (wood and bark) based on equations in Raile (1982) and converting this to biomass using the same specific gravities used for the bole wood and bark
- calculating the top biomass (tree tip and all branches) by subtracting all other biomass components from the total aboveground estimate
- calculating an adjustment factor by developing a ratio between bole biomass calculated from VOLCFSND to bole biomass using equations from Jenkins and others (2003)
- applying the adjustment factor to all tree components derived from both Jenkins and Raile

The CRM approach is based on assumptions that the definition of merchantable bole in the volume prediction equations is equivalent to the bole (stem wood) in Jenkins and others (2003), and that the component ratios accurately apply.

The tables in this appendix describe the equations used in FIADB to estimate components of tree biomass, including stem wood (bole), top and branches combined, bark, stump, and coarse roots. Most of these components are estimated through a series of ratio equations as described by Jenkins and others (2003). Stem wood biomass is calculated directly from the sound cubic-foot volume of the tree bole, percentage of bark on the bole, and specific gravities of both wood and bark.

The individual component biomass values for bole, top, and stump are not available in FIADB for sapling-size timber tree species and all woodland tree species. Because saplings (trees from 1 to 4.9 inches in diameter) have no volume in FIADB, a ratio method was developed to compute a factor that is applied to saplings based on diameter and species, and the result is stored in DRYBIO_SAPLING. For woodland species (trees where diameter is measured at the root collar [DRC]), volume is calculated from the root collar to a 1½-inch top diameter. Because this volume accounts for a larger portion of the tree than timber species volume equations do, it was determined that the top and stump equations were not applicable to woodland species. Woodland tree volume is converted to biomass and stored in DRYBIO_WDLD_SPP, which is an estimate for total aboveground biomass, excluding foliage, the tree tip (top of the tree above 1½ inches in diameter), and a portion of the stump from ground to DRC. Therefore, only total aboveground and belowground biomass values are estimated for saplings and woodland species.

Definitions of each biomass component and the equations used to estimate the oven-dry weight in pounds are shown in appendix tables J-1 through J-4.

- Appendix table J-1 defines the columns that are stored in the TREE table, and clarifies the set of trees (species, dimensions, live or dead, etc) that are used in each calculation.

- Appendix table J-2 defines the Jenkins component equations and explains how the equation results are used to estimate biomass. The ‘Estimate name’ in this table is the same name found in the coefficient definitions described in the biomass-related columns 38 to 49 of the REF_SPECIES table.

- Appendix table J-3 contains the Jenkins equations used to estimate each biomass component. The equations use the exact coefficient column names found in the REF_SPECIES table (for example, JENKINS_TOTAL_B1 in appendix table J-3 is the column name in REF_SPECIES that holds the value of the coefficient needed in the total aboveground biomass equation). The Jenkins equations use the measured tree diameter to produce an estimate.

- Appendix table J-4 contains the actual equations used in the FIADB to estimate the biomass components stored in the TREE table. These equations are a blend of Jenkins ratios, calculated bole biomass (based on calculated volume from the TREE table), and adjustment factors. The adjustment factor is an important step because it relates measurement-based bole biomass (DRYBIO_BOLE) to generalized equation-based bole biomass to improve or adjust the computed results of the Jenkins equations.

For more information please consult the publication by Heath and others (2009), titled *Investigation into Calculating Tree Biomass and Carbon in the FIADB Using a Biomass Expansion Factor Approach*.

Appendix table J-1. Definition of Biomass Components stored in the TREE table

Component	Column name	Biomass Component Definition (all are oven-dry biomass, pounds)
Merchantable stem (bole)	DRYBIO_BOLE	Merchantable bole of the tree, includes stem wood and bark, from a 1-foot stump to a 4-inch top diameter. Based on VOLCFSND and specific gravity for the species. For timber species with a DIA ≥5 inches. Includes live and dead trees. (Note that VOLCFGRS or VOLCFNET might be used after adjustment based on national averages, if VOLCFSND is not available.)
Top	DRYBIO_TOP	Top of the tree above 4 inches diameter and all branches; includes wood and bark and excludes foliage. For live and dead timber species with a DIA ≥5 inches.
Stump	DRYBIO_STUMP	Stump of the tree, the portion of a tree bole from ground to 1 foot high, includes wood and bark. For live and dead timber species with a DIA ≥5 inches.
Belowground	DRYBIO_BG	Coarse roots of trees and saplings with a DIA ≥1 inch. For timber and woodland species, and live and dead trees.
Saplings	DRYBIO_SAPLING	Total aboveground portion of live trees, excluding foliage. For timber species with a DIA ≥1 inch and <5 inches.
Woodland tree species	DRYBIO_WDLD_SPP	Total aboveground portion of a tree, excluding foliage, the tree tip (top of the tree above 1½ inches in diameter) and a portion of the stump from ground to DRC. For live and dead woodland species with a DIA ≥1 inch. Woodland species can be identified by REF_SPECIES.WOODLAND = X. Woodland species usually have TREE.DIAHTCD = 2 and TREE.WDLDSTEM >0.

Appendix table J-2. Jenkins Biomass Component Equation Definitions (Refer to the REF_SPECIES table for equation coefficients and adjustment factors)

Component	Estimate name	Definition
Total aboveground biomass	total_AG_biomass_ Jenkins	Total biomass (oven-dry, pounds) of the aboveground portion of a tree. Includes stem wood, stump, bark, top, branches, and foliage.
Stem wood biomass ratio	stem_ratio	A ratio that estimates biomass of the merchantable bole of the tree by applying the ratio to total_AG_biomass_Jenkins. Includes wood only. This is the portion of the tree from a 1-foot stump to a 4-inch top diameter.
Stem bark biomass ratio	bark_ratio	A ratio that estimates biomass of the bark on the merchantable bole of the tree by applying the ratio to total_AG_biomass_Jenkins.
Foliage biomass ratio	foliage_ratio	A ratio that estimates biomass of the foliage on the entire tree by applying the ratio to total_AG_biomass_Jenkins.
Coarse root biomass ratio	root_ratio	A ratio that estimates biomass of the belowground portion of the tree by applying the ratio to total_AG_biomass_Jenkins.
Stump biomass	stump_biomass	An estimate of the stump biomass of a tree, from the ground to 1 foot high. Uses a series of equations that first estimate the inside and outside bark diameters, then estimate inside and outside bark volumes (Raile 1982). Wood and bark volumes are converted to biomass using specific gravity for the species.
Sapling biomass adjustment	JENKINS_SAPLING_ ADJUSTMENT	An adjustment factor that is used to estimate sapling biomass for the tree by applying the factor to the total aboveground estimate, excluding foliage. The adjustment factor was computed as a national average ratio of the DRYBIOT (total dry biomass) divided by the Jenkins total biomass for all 5.0-inch trees, which is the size at which biomass, based on volume, begins. This is used on timber and woodland species.

Appendix table J-3. Jenkins Biomass Equations (Actual B1 and B2 coefficients and adjustment factors are stored in the REF_SPECIES table.) Note: these equations are used in appendix table J-4 to estimate the biomass components stored in the TREE table.

Component	Equation
total_AG_biomass_Jenkins (pounds) (total aboveground biomass, includes wood and bark for stump, bole, top, branches, and foliage)	= exp(JENKINS_TOTAL_B1 + JENKINS_TOTAL_B2 * ln(DIA*2.54)) * 2.2046
stem_ratio	= exp(JENKINS_STEM_WOOD_RATIO_B1 + JENKINS_STEM_WOOD_RATIO_B2 / (DIA*2.54))
bark_ratio	= exp(JENKINS_STEM_BARK_RATIO_B1 + JENKINS_STEM_BARK_RATIO_B2 / (DIA*2.54))
foliage_ratio	= exp(JENKINS_FOLIAGE_RATIO_B1 + JENKINS_FOLIAGE_RATIO_B2 / (DIA*2.54))
root_ratio	= exp(JENKINS_ROOT_RATIO_B1 + JENKINS_ROOT_RATIO_B2 / (DIA*2.54))
stem_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * stem_ratio
bark_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * bark_ratio
bole_biomass_Jenkins (pounds)	= stem_biomass_Jenkins + bark_ biomass_Jenkins
foliage_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * foliage_ratio
root_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * root_ratio
stump_biomass_Jenkins (pounds)	Volumes of wood and bark are based on diameter inside bark (DIB) and DOB equations from Raile 1982. DIB = (DIA * RAILE_STUMP_DIB_B1) + (DIA * RAILE_STUMP_DIB_B2 * (4.5-HT) / (HT+1)) DOB = DIA + (DIA * RAILE_STUMP_DOB_B1 * (4.5-HT) / (HT+1)) Volume is estimated for 0.1ft (HT) slices from ground to 1 foot high (HT), and summed to compute stump volume. Bark_volume = Volume_outside_bark – Volume_inside_bark Bark and wood volumes are multiplied by their respective specific gravities and added together to estimate biomass
top biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins – stem_biomass_Jenkins – bark_biomass_Jenkins – foliage_biomass_Jenkins – stump_biomass_Jenkins

Appendix table J-4. Equations used to calculate Biomass Components stored in the TREE table

Column name	Equation (refer to Appendix J-3 for details on variables found in equations below)
Adjustment factors	**AdjFac** = DRYBIO_BOLE / bole_biomass_Jenkins **AdjFac_woodland** = DRYBIO_WDLD_SPP / (total_AG_biomass_Jenkins – foliage_biomass_Jenkins)
DRYBIO_BOLE (wood and bark) (see note below) (timber species only)	VOLUME = VOLCFSND (or VOLCFGRS, VOLCFNET that are adjusted for the percent sound) Volume = includes the volume of sound wood from a 1-foot stump to a 4-inch top diameter (merchantable bole) = (VOLUME * (BARK_VOL_PCT / 100.0) * (BARK_SPGR_GREENVOL_DRYWT * 62.4)) + (VOLUME * (WOOD_SPGR_GREENVOL_DRYWT * 62.4))
DRYBIO_TOP (timber species only)	= top_biomass_Jenkins * **AdjFac**
DRYBIO_STUMP (timber species only)	= stump_biomass_Jenkins * **AdjFac**
DRYBIO_SAPLING (timber species only)	= (total_AG_biomass_Jenkins – foliage_biomass_Jenkins) * JENKINS_SAPLING_ADJUSTMENT
DRYBIO_WDLD_SPP (woodland species only)	Woodland species are identified by REF_SPECIES.WOODLAND = X. They usually have TREE.DIAHTCD = 2 and TREE.WDLDSTEM >0. For woodland species, volume equations produce volume of wood and bark, from DRC to a 1½-inch top diameter, and includes branches. Biomass equations for each component are not available, therefore stem volume is converted to biomass and stored in DRYBIO_WDLD_SPP. This is an estimate of total aboveground biomass for woodland species, which includes wood and bark for the stem and branches and excludes foliage, the tree tip (top of the tree above 1½ inches in diameter), and a portion of the stump from the ground to the point of diameter measurement. For trees with a DRC >=5 inches: VOLUME = VOLCFSND (or VOLCFGRS, VOLCFNET that are adjusted for the percent sound) VOLUME = includes the volume of wood, bark, and branches Wood and bark volumes need to be separated before converting to biomass as follows: = (VOLUME * (BARK_VOL_PCT / 100.0) * (BARK_SPGR_GREENVOL_DRYWT * 62.4)) + ((VOLUME – (VOLUME * (BARK_VOL_PCT / 100.0))) * (WOOD_SPGR_GREENVOL_DRYWT * 62.4)) For trees with a DRC <5 inches: = (total_AG_biomass_Jenkins – foliage_biomass_Jenkins) * JENKINS_SAPLING_ADJUSTMENT

Column name	Equation (refer to Appendix J-3 for details on variables found in equations below)
DRYBIO_BG (timber and woodland species)	= root_biomass_Jenkins * **AdjFac** (for timber spp ≥5 inches DBH) = root_biomass_Jenkins * JENKINS_SAPLING_ADJUSTMENT (for timber species <5 inches DBH) = root_biomass_Jenkins * **AdjFac_woodland** (for woodland species ≥1 inch DRC)
Note: If DIA ≥ 5.0 and VOLCFSND >0 then VOLUME = VOLCFSND If DIA ≥ 5.0 and VOLCFSND = (0 or null) and VOLCFGRS >0 then VOLUME = VOLCFGRS * Percent Sound If DIA ≥ 5.0 and VOLCFSND and VOLCFGRS = (0 or null) then VOLUME = VOLCFNET * (Average ratio of cubic foot sound to cubic foot net volume, calculated as national averages by species group and diameter)	