

Protocols:
Aspen Location and Condition Data Form
Aspen Delineation Project



PROTOCOL OVERVIEW

The Aspen Location and Condition Data Project is designed to help

- identify the location of aspen stands within the project boundaries
- provide an accurate description of stand structure
- record conditions that might be putting stands at risk
- indicate unique stand management conditions
- facilitate easy data transfer into GIS
- provide data that can be used for analysis.

The Aspen Location and Condition Data Protocols listed below are divided into three parts:

- Protocols: Preparing for Field Surveys.....Part A....page 3
- Protocols: Conducting Stand Location and Condition Field Surveys.....Part B....page 4
- Protocols: POST Field Survey Protocols.....Part C....page 12

The part entitled Protocols: Conducting Stand Location and Condition Field Surveys is subdivided into eight sections. These are the same eight sections found on the Field Form.

The sections are:

- Stand Definition..... page 4
- Stand Identification and Location..... Section 1....page 5
- Overstory Canopy Level (Aspen >8" dbh)..... Section 2....page 7
- Mid Level Aspen Canopy (Aspens 1" dbh to 8" dbh)..... Section 3....page 8
- Aspen Understory (Aspen <1" dbh)..... Section 4....page 10
- Stand Management Issues..... Section 5....page 11
- Field Map and Notes..... Section 7....page 12
- Stand Loss Risk Factor..... Section 8....page 14

Included in these protocol instructions are explanations (Titled: Overviews) to why certain data is being collected, as well as definitions of some possibly confusing terms.

If there is confusion on any part of the protocols, please ask the project coordinator for assistance.

PART A: PROTOCOLS: PREPARING FOR FIELD SURVEYS

OVERVIEW	<p>Prior to starting field survey, work with project coordinator to</p> <ul style="list-style-type: none"> • Identify all existing office records on aspen locations within the project boundaries. • Prioritize areas that will be inventoried. • Establish what Stand Code Identifiers will be used. (See protocols in section: Stand Identification and Location for explanation of Stand Code Identifiers) • Gather all equipment needed for day in field (see list below)
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FIELD EQUIPMENT LIST

GPS Unit
Set to: 1927 North American Datum (NAD27 CONUS)
Compass (zeroed to true North)
UTM Grid Reader
1:24 000 Quad Map
Pencil
Blank Field Forms
Copy of Protocols
Metal Clip Board
Yale Key
Binoculars
Camera and Film (or Digital Camera)
dbh tape
Clinometer and Densiometer
Radio
Extra batteries for GPS and camera
Notebook

NOTES:

[illegible]

Part B: CONDUCTING STAND LOCATION AND CONDITION FIELD SURVEYS

DEFINITION OF STAND

Aspen stands shall be defined using the definition of "stand" as defined by the California Native Plant Society--Vegetation Rapid Assessment Protocols (February 200 page 3). (Underlining and bold face added)

"To start the rapid assessment method, stands of vegetation needs to be defined. A stand is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small, such as alpine meadow or tundra types, and some may be several square kilometers in size, such as desert or forest types. **A stand is defined by two main unifying characteristics:**

- 1) It has **compositional integrity**. Throughout the site, the combination of species is similar. **The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or indistinct.**
- 2) It has **structural integrity**. It has a similar history or environmental setting that affords relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest originally dominated by the same species that burned on the upper part of the slopes, but not the lower, would be divided into two stands. Likewise, a sparse woodland occupying a slope with very shallow rocky soils would be considered a different stand from an adjacent slope with deeper, moister soil and a denser woodland or forest of the same species.

The structural and compositional features of a stand are often combined into a term called homogeneity. For an area of vegetated ground to meet the requirements of a stand, it must be homogeneous."

In identifying aspen stands consistent with the CNPS definition, an aspen "stand" shall exist as a unique stand with its own stand identifier (UTM coordinates) when at least 60% of the stand can be described as having the characteristics described on the field form. This allows the rest of the stand to be averaged into the homogeneous characteristic.

The CNPS definition can also be used to describe two or more aspen stands that may be adjacent (share a common boundary with each other}. The determiner for deciding that there is more than one stand shall be that each stand has its own distinct **compositional and structural integrity--i.e., each is homogeneous**. As with a single stand, each stand must have **>60% compositional and structural integrity** .

1B: STAND IDENTIFICATION AND LOCATION

OVERVIEW	<p>The goals and objectives of this segment are</p> <ul style="list-style-type: none"> to give each stand a unique identifier code to identify the location of stands using a GPS unit in two different ways--as a point and as a polygon. to indicate some of the physical characteristics of the stand such as elevation, slope, acreage. <p>Definitions:</p> <p>Stem: Any above-ground aspen growth no matter what size-i.e., a 20" dbh aspen is a stem and a 6" tall aspen sucker (shoot) is a stem.</p> <ul style="list-style-type: none"> Sucker (Shoot): A young aspen stem (in the context of this survey form the term sucker is use to describe stems that are <4.5 feet tall). Suckers grow from lateral roots and are also often called ramets.
Stand: Forest Code	<p>All National Forest stands are given the National Forest Code for the Forest.</p> <p>Note: This is a special code assigned to this unit of the Forest Service and is used consistently throughout the agency. If these protocols are used in another Forest, please use the proper Forest Code for that National Forest. If the survey form is used by a governmental agency other than the Forest Service, please notify the Aspen Delineation Project : (peregrines@prodigy.net) to confirm your agency's code.</p>
Stand: District Code	<p>All Ranger District stands are given District Code</p> <p>Note: As described in the note above, this is also a special code assigned to this unit of the Forest Service and is used consistently throughout the agency. If these protocols are used in a National Forest use the proper District Code for that Forest. If the survey form is used by an agency other than the Forest Service, please notify the Aspen Delineation Project: (peregrines@prodigy.net) to establish your agency's code.</p>
Stand: Stand Code	<p>Each individual stand has a unique identifier.</p> <p>The identifier has two parts</p> <ol style="list-style-type: none"> a two-letter code that refers to the general geographic area where the stand is located <ul style="list-style-type: none"> a numeric number that distinguishes it from other stands in the same geographic area (Example: MT-01 could be a identifier to the first stand found in the Vicinity of Mount Talac). Do not use repeat two-letter codes when changing geographic areas. At the beginning of any inventory effort, check with the project coordinator to establish what two letter codes have already been used. <p>Note: As explained in the codes above (Forest Code and District Code) each stand has a string of codes in front of this stand's unique identifier. This allows every aspen stand inventoried anywhere in any agency to be identified uniquely. This system facilitates the merger of data between District, Forest, and agencies.</p>

GPS ID: Point (UTM Coordinates)	<ul style="list-style-type: none"> Set datum to GPS : 1927 North American Datum (NAD27 CONUS) Establish for each stand one GPS reading that can be used as a unique identifier (PR =Point Reference) for indicating a stand's location. When possible take the GPS reading in the center of the stand. If you cannot take a reading from the center, take the reading from the edge of the stand. If that is not possible, take the reading from as close to the stand as possible. In all cases indicate on your field map (backside of Field Survey Form) where the PR (Point Reference) was taken in relation to the rest of the stand. Next, save this GPS reading in your GPS unit. Give it the same Stand Code that you have established for this stand.
.GPS ID: Polygon: (Multiple UTM References)	<p>The goal of taking additional GPS readings around the perimeter of a stand is to aid in drawing a representative polygon on a Quad map and/or in a GIS.</p> <p><u>Consult with the Project Manager regarding the protocols for establishing a representative polygon.</u> The project manager has developed protocols based on the GPS equipment used and the degree of accuracy desired in the representative polygon.</p>
Elevation	<u>Consult with the Project Manager regarding the protocols for establishing elevation</u>
Slope (%)	<ul style="list-style-type: none"> Use a Clinometer to obtain average slope within a stand . Measure in %. Indicate in field notes on the back of the survey form if there are any significant variations (greater than 50% from this reading within the stand).
Quad Name	<ul style="list-style-type: none"> Name of quad (1:24000) on which stand is located
Stand Dimensions	<p>Approximate dimensions of stand. This approximation will (1) assist in placing the stand in the appropriate class size (see directions below), (2) drawing field a map on back of this survey form, (3) drawing polygon on a quad map and (4) drawing a polygon in GIS.</p> <p>• <u>FIELD CALIBRATION PROTOCOLS:</u> At least once a day, pace a stand to assist in making more accurate ocular approximations of dimensions.</p>
Class sizes	<u>Consult with the Project Manager regarding the protocols for establishing class sizes.</u>

NOTES: _____

2B. OVERSTORY CANOPY LEVEL (ASPEN >8"DBH)

OVERVIEW	<p>Focus your attention "upward" toward the canopy level at which aspen >8"dbh could occur. This section of the survey will allow you to give an accurate description of what you see at this level of the stand. The answers will indicate (1) what percentage of this potential canopy cover is actually taken up by some species, (2) whether aspens are present in this level of the canopy, (3) whether conifers are present in this level of the canopy, and (4) the ratio dominance between aspen and conifers.</p>
<p>% actual overstory canopy cover (All Species): 100-85% 84-51% 50-16% 15-1% 0%</p>	<p>Indicate the closest % that represents the actual overstory canopy cover present (all species). This answer will give an indication of the relative density of the vegetation in this canopy level as compared to what it could be. On the field form there are five classes in which you can place your overstory cover ocular estimation. Note that one of the classes is 0%. This is to be used when there are no aspen or conifers in the potential overstory canopy.</p> <p>Definitions:</p> <ul style="list-style-type: none"> • Overstory Canopy Level: The canopy level that is represented by vegetation that is equal to the height or greater than the height that aspens >8'dbh reach. • Actual Overstory Canopy Cover: The total aerial cover (canopy closure) of all live tree species that are specifically in the overstory canopy level. <p>FIELD CALIBRATION PROTOCOLS: For assistance in establishing ocular estimations of actual overstory canopy cover, use a densiometer at least once a day to estimate percentage canopy.</p> <p>Protocol: Establish four transect in representative areas of the stand. Using a densiometer take 10 readings equally distanced across the transects (use paces to identify spacing). Record "canopy hits" when they occur. At the completion of the four transects, divide the number of hits by 40 and multiply the answer by 100. That will give the percentage canopy cover. (Example: there are 20 "canopy hits out of 40 possible. Thus $20/40=.50 \times 100=50\%$.</p> <p>If you have any questions regarding this protocol please ask the Project Manager.</p>
<p>Conifers have overtopped (>50%) aspen (majority of aspen are shaded). Ratio Conifer: Aspen: 10:0 8:2 6:4</p>	<ul style="list-style-type: none"> • Indicate if there are more conifers overtopping (>50%) aspen in the overstory canopy level than there are aspen overtopping conifers. • Indicate the closest ratio (conifer:aspen) representing the mix of conifers overtopping aspen . (Example: 8:2 means that for every 8 conifers dominating the overstory there are only 2 aspen dominating the overstory.) <p>Definitions:</p> <ul style="list-style-type: none"> • Overtopping: Growing taller than another species, thus shading that species

	<ul style="list-style-type: none"> • (Conifer to Aspen): The ratio of conifers to aspen representing the observed condition of a particular canopy level. • Dominant: To be taller (In this case indicating which species is tallest)
Conifers are co-dominant with aspen, (aspen canopy =conifer canopy cover) Ratio Conifer: Aspen: 5:5	<ul style="list-style-type: none"> • Indicate if the tallest conifers and the aspen in this canopy level are at the same height. • Indicate that the general ratio (Conifer:Aspen) is 50/50 - i.e. an equal mix of the tallest conifers and aspens. • <u>Definition:</u> Co-dominant: Equal or the same (in this case the number of the tallest conifers in this level is equal to the number of the tallest aspens)
Aspen dominate over conifers (aspen canopy >conifer canopy cover) Ratio Conifer: Aspen: 4:6 2:8 0:10	<ol style="list-style-type: none"> 1. Indicate if the aspen in this canopy level are dominant over the conifers which are in this canopy level. • Indicate the closest ratio (Conifer to Aspen) representing the mix of aspen dominating conifers. <u>NOTE: Aspens are represented by the second figure in this ratio</u> <p>Definition:</p> <ul style="list-style-type: none"> • Dominant: To be taller (In this case > 50% of aspens in this canopy level) than conifers in this canopy level
Aspen stand structure is decadent	<p>Definition:</p> <ul style="list-style-type: none"> • Decadent – Stand is in a state of decline or decay. More dead overstory or mid level stems present than live stems and sucker regeneration <500 stems/acre <p>Please review calibration protocols for ocular estimating 500 stems per acre. They are located in the protocol section titled: 4B. Aspen Understory</p>
Dominant conifer species	Indicate what species of conifer is the most dominant in this canopy level
NOT SURVEYED	Indicate if you were not able to complete this section of the Field Survey.

3B. MID-LEVEL ASPEN CANOPY (ASPENS 1" DBH to 8" DBH)

OVERVIEW	<p><u>Focus your attention "forward" toward the canopy level at which aspens 1" to 8"dbh could occur.</u> This section of the survey will allow you to give an accurate description of what you see at this level of the stand. The answers will indicate (1) what percentage of this potential canopy cover is actually taken up by some species, (2) whether aspens are present in this level of the canopy, (3) whether conifers are present in this level of the canopy, and (4) the ratio dominance between aspen and conifers.</p>
Closest % actual mid-level canopy cover (All Species): 100-85% 84-51% 50-16% 15-1% 0%	<p>Indicate the closest % that represents the actual mid-level canopy cover present (all species). This answer will give an indication of the relative density of the vegetation in this canopy level as compared to what it could be. On the field form there are five classes in which you can place your overstory cover ocular estimation. Note that one of the classes is 0%. This is to be used when there are no aspen or conifers in the potential overstory canopy.</p> <p>Definitions:</p> <ul style="list-style-type: none"> • Mid-Level Canopy: The canopy level that is represented by all

	<p>vegetation that is equal to the height of aspen 1" dbh and less than the height that aspens 8 inch dbh reach.</p> <ul style="list-style-type: none"> • Actual Mid-Level Canopy Cover: The total aerial cover (canopy closure) of all live tree species that are specifically in the mid-level canopy.
<p>Mid-level conifer canopy has overtopped (>50%) mid level aspen canopy. Ratio Conifer: Aspen: 10:0 8:2 6:4</p>	<ul style="list-style-type: none"> • Indicate if there are more mid-level conifers overtopping (>50%) aspen in the canopy level than there are mid-level aspen overtopping conifers. • Indicate closest ratio (conifer:aspen) representing the mix of conifers overtopping aspen . (Example: 8: 2 means that for every 8 conifers dominating the overstory there are only 2 aspen dominating the overstory.) <p><u>Definitions:</u></p> <ul style="list-style-type: none"> • Overtopping: Growing taller than another species, thus shading that species • Conifer: Aspen: The ratio of conifers to aspen representing the condition of a particular canopy level. • Dominant: To be taller (In this case indicating which species is tallest)
<p>Mid level conifers are co-dominant with mid level aspen Ratio Conifer to Aspen: 5:5</p>	<p>Indicate whether the tallest mid-level conifers and mid-level aspen in this canopy level are at the same height</p> <p>Indicate that the general ratio Conifer: Aspen is 5:5 -i.e., the mix of mid-level conifers and mid-level aspens is equal.</p> <p><u>Definition:</u></p> <ul style="list-style-type: none"> • Co-dominant: Equal or the same (in this case the number of the tallest mid-level conifers in this level is equal to the number of the tallest mid-level aspens.
<p>Mid level aspen dominate over mid level conifers _____ Ratio Conifer:Aspen 4:6 2:8 0:10</p>	<p>Indicate if the aspen in this canopy level are dominant over the <u>conifers which are in this canopy level.</u></p> <p>Indicate what is the closest ratio (conifer: aspen) representing the mix of aspen dominating conifers. <u>NOTE: Aspens are represented by the second figure in this ratio</u></p> <p><u>Definition:</u></p> <ul style="list-style-type: none"> • Dominant: To be taller (In this case > 50% of aspens in this canopy level are taller than conifers in this canopy level
<p>>50% Mid-level aspen dominated (shaded) by conifers located in overstory canopy</p>	<p>Indicate what effect the conifer overstory is having on the mid-level aspen</p>
<p>NOT SURVEYED</p>	<p>Indicate if you were not able to complete this section of the Field Survey.</p>

4B. ASPEN UNDERSTORY--ASPEN <1" DBH)

OVERVIEW	<p><u>Focus your attention "down" toward the canopy level at which aspens 1" dbh could occur.</u> This section of the survey will allow you to give an accurate description of what you see at this level of the stand. The answers will indicate if there is any regeneration currently occurring and what the condition of that regeneration is. Note: Research accepts a standard of >500 stems per acre as a minimum benchmark for indicating regeneration success. This section will also allow you to make observations regarding whether there are indications of browsing within the stand.</p> <p>Regarding Browse: Aspen suckers (young stems) are very palatable to both domestic and wild ungulates. If browsing caused by deer, cattle or sheep is continuous year after year, the terminal bud (terminal leader) of a stem will be unable to produce a leader to get beyond the browse zone (<4.5 feet is the browse zone). If continuous seasons of intense browsing occur then the stem may take on a hedged appearance or die. Continued intense browsing could eventually lead to the death of the stand.</p>
There is a distinctive (>500 stems/acre) regeneration stem age class) present	<p>Indicate if stand has a regeneration cohort</p> <p>Definition:</p> <ul style="list-style-type: none"> Cohort: Stems of the same age. In the case of evaluating aspen regeneration >500 stems /acre is the lowest number of stems /acre used to indicate significant regeneration. <p><u>FIELD CALIBRATION PROTOCOLS:</u> For assistance in establishing ocular estimations of >500 stems /acre do a random sample of a stand understory aspen twice a week following the protocols below.</p> <p>Protocol: Toss a rock twenty times randomly (behind your back) into areas of a stand that are representative of the distribution of suckers in the stand. Use a 3.75 foot radius pole (the circle it creates from where the rock hit will be 1/1000. Count the number of "hits" each circles. Take total number of hits divide that number by 20 and multiply by 1000. This will give you an estimation of stems/acre. (Example: 6 hits in twenty tosses: $6/20 = .3 \times 1000 = 300$ stems/acre.)</p>
Regeneration is present (>500 stems/acre) but growth >50% of stems is being suppressed by either overstory conifer canopy, Mid level conifer canopy, or shrubs	<p>Identify the canopy cover that is doing the most significant (>50%) damage to the sucker regeneration. A stressed sucker can be identified by observing that the terminal buds on stems are dying off (as opposed to being browsed.)</p> <p>Definition:</p> <p>Terminal bud (terminal leader): Growth at the tip of the primary stem</p>
Aspen regeneration is poor (<500 stems/acre)	Indicate if stand has does not have a regeneration cohort (<500 stems/acre)
Young conifers seedlings present (>500 per acre)	Identify presence of conifers <1" dbh
<p>Browsing intense (current terminal leader growth is completely removed on > 20% of stems)</p> <p>Browsing light to moderate (current terminal leader growth is completely removed on < 20% of stems)</p>	<p>Indicate if > 20% of current terminal leader growth has been browsed. Note: This percentage standard is based on standards and guidelines found in the SNFPA (Sierra Framework) or</p> <p>Indicate if < 20% of current terminal leader growth has been browsed.</p> <p>Definition:</p> <ul style="list-style-type: none"> Browse: Eating of bud, leaf, or stem

	<ul style="list-style-type: none"> • Terminal bud (terminal leader): Growth at the tip of the primary stem
Aspen suckers(>20%) have multiple leaders or are "hedged"	This is a key indicator that browsing has been an ongoing problem in stand.
NOT SURVEYED	Indicate if you were not able to complete this section of the Field Survey.

5B. STAND MANAGEMENT ISSUES

<u>OVERVIEW</u>	There are a number of additional factors that assist resource staff in analysis of stand conditions. They include but are not limited to unique physical characteristics of the stand, such as presence of insect/fungus damage, heritage issues, access to stand, and prior treatment. Check if any of the conditions listed below are found in the stand.
Adjacent to Permanent Riparian Corridor, Meadow, Spring/Fen, or Pond	Indicate if stand is within 50 feet of any of these physical features
Stand Within Geological Refugia	Definition: <ul style="list-style-type: none"> • Refugia: An environment conducive to stand continuation because of its protection from browsing pressures, conifer encroachment, or because of its location on a site with particular characteristics. • Lava Flow: Rock field created by lava venting • Talus Slope: Rock fall from any source (granite, lava, sediment) • Solid Rock Outcrop: Hard rock • Moraine Material: Accumulated rock material that has been transported by ice.
Insect Damage (>20% of stems)	Indicate if >20% of stems show signs of any signs of damage from one insect species
Disease damage (>20% of stems)	Indicate if >20% of stems show signs of any one pathogen pattern (conks, etc.)
Blowdown	Indicate if >25% of the stand has suffered significant wind damage--i.e., stems fallen in a consistent direction
Sagebrush	Indicate if >20% of stand contains sagebrush
Corn Lilies	Corn lilies will indicate a high water table(>25% of stand). Their presence may affect management decisions.
Conifer>30 dbh	Indicate their presence.
Archeological Site	Indicate signs of any heritage issues--i.e., carvings, grinding rocks, structures
Human Impacts (Trails/camping)	Indicate if any major impacts on stand is caused by regulated or non-regulated camping or trails in/or adjacent to stand.
Human Impacts (Structures)	Indicate if any major impacts on stand is caused by structures or owners of structures.
Prior treatment	Indicate any sign of conifer removal within stand, thinning of the aspen stems themselves, or prescribed burns.
Wildfire	Indicate any sign of recent wildfire fire within or adjacent to the stand.
Gully Cuts	Indicate any significant erosion (bare soil cuts) greater than three feet
Beaver Presence	Indicate signs of beaver--current or past
Water Diversion Effecting Stand	Indicate if there is any water diversions affecting water that would be naturally flowing through a stand or that is unnaturally being retained in a stand.
Nearest Improve Road	Give approximate distance to road access
NOT SURVEYED	Indicate if you were not able to complete this section of the Field Survey.

7C--FIELD MAP AND NOTES:

Field Map and Notes Photo References	<p>The field map is drawn (1) to indicate shape and size of stand, (2) relationship of stand to special features within and adjacent to the stand, (3) location of stand identifier, (4) location of additional GPS readings, (5) location of special management issues, and (6) location of any special vegetation features within or adjacent to the stand.</p> <p>The Field Notes should be taken to remind surveyor of any special features of the stand, and for elaboration of any of the issues raised on the first page of the field survey.</p> <p>The Project Manager will develop a protocol for (1) number of photos taken per stand, (2) coding photos, and (3) storage photo records.</p>
Quad Map	With the aid of GPS data and field maps and field notes, the surveyor should draw a polygon on a clean quad map, and a copy of the section of the quad with the stand polygon drawn should be attached to the Field Survey Form, This should be done at the end of each day in the field or at the time interval designated by the Project Manager
GPS Data	The Project Manager will indicate the protocol for downloading GPS data. This will vary from one project to another depending upon the GPS unit used and whether a GIS is the final location for GPS data.

PART C: POST FIELD SURVEY PROTOCOLS

OVERVIEW	(Will be added later)
GPS Data	The Project Manager will indicate the protocol for downloading GPS data. This will vary from one project to another depending upon the GPS unit used and whether a GIS are the final location for GPS data.
Record Storage <ul style="list-style-type: none"> • Photos • Forms 	<p>The Project Manager will develop protocols</p> <ul style="list-style-type: none"> • for marking and storing photos • for storing completed field forms

Notes:

RISK OF STAND LOSS ANALYSIS

HIGHEST: The clone is being lost from above AND is not being replaced from below.

- Conifer crowns have overtopped the aspen crowns, (primary risk factor), and
- Conifer species comprise at least half the canopy (primary risk factor), *and*,
- Regeneration absent or unsuccessful due to excessive browsing or other factors (primary risk factor)

(If both **primary** risk factors are indicated on field form, then the ranking = highest)

HIGH: The clone is being lost from above OR is not being replaced from below.

(If at least one of the primary risk factors affecting crown and regeneration is indicated on field form, then the ranking = high)

MODERATE: One or more risk factors below is present, but clone not in immediate danger.

May include one or more of the below:

- conifer closure >25%, but <50% [if >50%, rating is High or Highest]
- aspen cover <40%
- dominant aspen are decadent
- aspen regeneration 5-15' tall is <500 stems per acre
- regeneration being excessively shaded by conifers
- browsing is limiting extent and numbers of successful (>5' tall) regeneration

(If one or more of these risk factors is indicated on field form then ranking = moderate)

LOW: Clone essentially healthy, either mature trees and/or regeneration for the most part healthy and vigorous, no obvious signs that the clone has receded, <15% of the clone affected by risk factors.

NONE: None of the above risk factors present, mature trees vigorous, regeneration 5-15' tall ≥ 500 dbh.