FOREST INVENTORY AND ANALYSIS
NATIONAL CORE FIELD GUIDE

VOLUME I: FIELD DATA COLLECTION PROCEDURES FOR PHASE 2 PLOTS

Version 9.0

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Changes from the Phase 2 Field Guide version 8.0 to version 9.0

These change pages are intended to highlight significant changes to the field guide. Items in bold have associated change proposals.

- Note: The species lists in the former appendix 3 (continental U.S and Caribbean Islands species) and appendix 14 (Pacific Islands, including Hawaii species) have been replaced by a new Master Species List that is now appendix 3. This list contains all species tallied by FIA, including urban species, in the continental U.S, Caribbean Islands, and Pacific Islands, including Hawaii. FIA tallies only tree species that are listed in Appendix 3, after taking into account the three exclusion zones that are the first three columns in appendix 3 and defined in appendix 6, the glossary. This description of which trees are tallied replaces the concept of CORE and CORE OPTIONAL used in previous field guides

- 0.1 Plot Setup. Corrected the third bullet to accommodate the change in RECONCILE. Changed "Assign RECONCILE codes 3 or 4 (i.e., missed live or missed dead) to all trees on the new subplot." to "Assign RECONCILE code 7 (cruiser error) to all trees on the new subplot."

- 1.12 FIELD GUIDE REVISION. Changed the value from 7.2 to 9.0.

- **2.3.1 Forest Land. Added the new variable 2.4.3 FOREST LAND CONDITION STATUS CHANGE to the list of variables listed as "Ancillary – changes do not delineate a new condition class".**

- **2.3.2 Nonforest Land. Added the new variable 2.4.3 FOREST LAND CONDITION STATUS CHANGE to the list of variables listed as "Ancillary – changes do not delineate a new condition class".**

- **2.4.3 FOREST LAND CONDITION STATUS CHANGE – INTO OR OUT OF FOREST LAND. Added this new condition-level variable.** Adjusted the numbers of the variables following this new variable as needed.

- 2.5.28 COVER CLASS. Text about which tree species to include was changed in code 01 (Tree Cover) to accommodate the new Master Species list in Appendix 3. Text was also added to code 03 (Herbaceous Cover) and code 08 (Barren) to clarify the meaning of the codes.

- **3.18 UNLISTED TREE PRESENT. Added this new plot-level variable.**

- **3.19 UNLISTED TREE GENUS. Added this new plot-level variable.**

- **3.20 UNLISTED TREE SPECIES. Added this new plot-level variable.**

- **3.21 UNLISTED TREE SPECIES COUNT. Added this new plot-level variable.**

- **3.22 UNLISTED TREE SPECIMEN COLLECTED (CORE OPTIONAL. Collected in NRS, RMRS) Added this new plot-level variable.**

- **3.23 SPECIMEN LABEL NUMBER (CORE OPTIONAL. Collected in NRS, RMRS) Added this new plot-level variable.**

- **3.24 UNLISTED TREE NOTES. Added this new plot-level variable.**

- 5.0 TREE AND SAPLING DATA. Modified the second bullet near the bottom of the section. In the last sentence changed "RECONCILE = 3 or 4" to "RECONCILE = 7 or 8". This accommodates the change to RECONCILE.

- **5.6 PREVIOUS TREE STATUS. Added text to accommodate the deletion of codes 3 and 4 in 5.7.1 RECONCILE.**

- **5.7 PRESENT TREE STATUS. Modified the text. Changed the final sentence as follows; This information is needed to correctly assign the tree~~'s volume~~ to the proper component of ~~volume~~ change. Also clarified the last sentence of code "0".**

- **5.7.1 RECONCILE. Deleted codes 3 and 4. Added a lot of text for clarification of the codes and their use. Also updated the abbreviated sapling coding example list to accommodate the deletion of codes 3 and 4.**

- **5.8 SPECIES. Added extensive text for clarification when using the new Master Species list, including tables showing the exclusions. Also added a new figure (fig. 23) showing the National Forest System Regions.**

- **5.9 Diameter. Remeasurement trees: in the second paragraph, the defined number of "…a group of multiple forks…" was clarified as "(≥3)".**

- **5.9.2 DIAMETER AT BREAST HEIGHT (DBH). Additional text was added under special DBH situations: 1. Forked tree – general text.**

- **5.9.2 DIAMETER AT BREAST HEIGHT (DBH). Added a new figure, which became a new Figure 28. The figures following the new Figure 28 were renumbered. Text references were also updated to match the new numbers.**

- **5.9.2 DIAMETER AT BREAST HEIGHT (DBH). Additional text was added under Measure Low Approach: general text; number 1; number 2; and number 3.**

- **5.9.2 DIAMETER AT BREAST HEIGHT (DBH). Deleted old Figures 30 and 31. Added a new figure 32.**

- **5.9.2 DIAMETER AT BREAST HEIGHT (DBH). Figure 35. Part H and part I were replaced with new drawings.**

- **5.9.2 DIAMETER AT BREAST HEIGHT (DBH). Additional text was added under special DBH situations: 4. Tree with irregularities at DBH – general text.**

- 8.2 General Definitions. Growth Habits. Modified the second sentence in the second paragraph to accommodate the new Master Species List. Deleted the text "…by regional core/core optional tree species lists" and added the text "…determined only including tree species that are listed in Appendix 3, after taking into account the three exclusion zones (see variable 5.8 SPECIES)."

- 8.4 Vegetation Structure. Vegetation Structure Growth Habits. Modified code **TT (Tally Tree Species)** in this definition to accommodate the new Master Species List. Deleted the text "All core tree species **and** any core optional tree species selected by a particular FIA unit." And added the text "Only include tree species that are listed in Appendix 3, after taking into account the three exclusion zones (see variable 5.8 SPECIES)."

- 8.5.1 SPECIES GROWTH HABIT. Footnote 2. Modified the text of footnote 2 to accommodate the new Master Species List. Deleted the text "All core tree species and any core optional tree species selected by a particular FIA unit" and added the text "Only include tree species that are listed in Appendix 3, after taking into account the three exclusion zones (see variable 5.8 SPECIES)."

- Appendix 1. State and County, Parish, or Borough FIPS Codes. Change made in the list of appendices that precedes appendix 1. Changed the title of appendix 14 because the old Pacific Islands codes are now part of appendix 3, and the appendix is now a list of species code changes.

- Appendix 2. FIA Forest Type Codes. Modified forest type descriptions for codes 225, 226, and 361.

- **Appendix 3. FIA Tree Species Codes. The species code list in this appendix was replaced by the new Master Species Code List, which is a national composite list of all tree species tallied by FIA.**

- **Appendix 6. Glossary. Added definitions for the following terms: Cultivar; Hybrid; Mainland Exclusion (MLE); Master Species List; National Forest Region Exclusion (NFS 1, 2, 3, 4, 5, 6, 8, 9, and/or 10); Non-Urban Exclusion (NUE); Subspecies; Tree (FIA definition); and Variety.**

- Appendix 6. Glossary. Deleted the term “Forest Trees” and the definition because they do not match the FIA definition of forest.

- Appendix 7. Tolerance/MQO/Value/Units/Field Width/When Collected table. Changed Value of Field Guide Version from “8.0” to “9.0”. Updated the appendix for the new variables and for changes to RECONCILE.

- **Appendix 8. Tree Coding Guide. The table was updated to accommodate the changes in RECONCILE.**

- **Appendix 14. FIA Pacific Islands Tree Species Codes. Deleted this species code appendix because the Pacific Islands codes are now in appendix 3**.

- Appendix 14. Changes in the species code list (appendix 3) beginning in version 9.0 (October, 2019). Created a new appendix 14 to document the changes in the Master Species List over time, beginning with version 9.0.

Additional changes (1/30/2020)

Note: Internal files for field guide preparation: Changes in appendix 3 and appendix 14 are indicated using track changes. Changes in ALL other sections and appendices listed below are indicated using track changes AND yellow highlighting.

- 2.4.3 FOREST LAND CONDITION STATUS CHANGE – New Forest Condition or Loss of Previous Forest Condition. Code 0 was modified from “No change – the condition is not a new forested condition nor is it a new condition that is the result of a previously forested condition no longer qualifying as such.” to “No change – the condition is not a new forested condition nor is it a new condition that is the result of a previously forested condition no longer qualifying as such or the condition was previously not field visited or was previously classified as non-sampled.”

- 3.18 UNLISTED TREE PRESENT. Added the word ‘live’ to the first sentence in the second paragraph so that it reads “An UNLISTED TREE is defined as a live tree that is at least 5.0 inches DBH / DRC located within a subplot that is not on the Master Species List OR is on the list but is found within an exclusion zone where it is not a legal tally tree.”

- 5.8 SPECIES. Clarified text in the first two paragraphs. Clarified the definition of Non-urban exclusion (NUE). In the NUE table, added species 299, 300, 998 and 7469. Clarified the definition of National Forest Region exclusion (NFS). In the NFS table, added species 5146, and deleted species 300 and 998. Clarified the definition of Mainland exclusions (MLE).

- Appendix 3. FIA Tree Species Codes. Added the following species: 299 (unknown dead conifer) and 5146 (vine maple). Deleted the following species: 8942 (common pricklyash) and 8944 (Hercules' club). For species 300 (acacia spp) and 998 (unknown dead hardwood), removed "all" from the *NFS Region Exclusion* column and added "NUE" to the *Non-Urban Exclusion* column. For species 7469 (yaupon), added "NUE" to the *Non-Urban Exclusion* column.

- Appendix 6. Glossary. Clarified the following terms to match changes in the main text: Mainland Exclusion (MLE), Master Species List, National Forest Region Exclusion (NFS 1, 2, 3, 4, 5, 6, 8, 9, and/or 10), and Non-Urban Exclusion (NUE). The term "Urban areas" and its definition were added.

- Appendix 7. Tolerance/MQO/Value/Units/Field Width/When Collected table. Updated the *When collected* for FOREST LAND CONDITION STATUS CHANGE to read "CONDITION CLASS STATUS = 1, 2, 3, or 4 on remeasured plots."

- Appendix 14. Changes in the species code list (appendix 3) beginning in version 9.0 (October, 2019). Modified the list to accommodate the 1/30/2020 changes in appendix 3.

FOREST INVENTORY AND ANALYSIS
NATIONAL CORE FIELD GUIDE

VOLUME I: FIELD DATA COLLECTION PROCEDURES FOR PHASE 2 PLOTS

Version 9.0

Version History:
1.1 March 1999 (first version implemented, Maine, 1999)
1.2 August 1999
1.3 September 1999 (revised from Bangor, ME Data Acquisition Band meeting, Aug. 1999)
1.4 February 2000 (revised from Charleston, SC Data Acquisition Band meeting, Dec 1999)
1.5 January 2001 (revised from Portland, OR Data Acquisition Band meeting, Sept. 2000)
1.6 March 2002 (revised from Tucson, AZ Joint Band meeting, Jan. 2002)
1.7 February 2003 (revised from Charleston, SC Joint Band Meeting, Feb. 2003)
2.0 April 2003 (revised from Atlantic City, NJ, Data Acquisition Band Meeting, Mar. 2003)
October 2003 (revised from Anchorage, AK, Data Acquisition Band Meeting, Aug. 2003)
January 2004 (revised from Data Acquisition Band conference calls with FIA Management Team Approval)
August 2004 (revised from Asheville, NC, Data Acquisition Band Meeting, Aug. 2004)
3.0 October 2005 (revised from change management process, change proposals approved by FIA Management Team, from Asheville, NC, Data Acquisition Meeting, Aug. 2004, and from Las Vegas, NV, Data Acquisition Meeting, Mar. 2005)
4.0 October 2007 (revised from change management process, change proposals approved by FIA Management Team, from Flagstaff, AZ, Data Acquisition Band Meeting, Sept. 2006, and from multiple Data Acquisition Band conference calls)
5.0 July 2009 (revised from change management process, change proposals approved by FIA Management Team, from Charleston, SC, Data Acquisition Band Meeting, Mar. 2009, and from multiple Data Acquisition Band conference calls)
October 2010 (revised from change management process and from Portland, OR, Data Acquisition Band Meeting, Feb. 2010 and subsequent conference calls)
6.0 October 2012 (revised from change management process, change proposals approved by FIA Management Team; from Portland, OR, Data Acquisition Band Meeting, Feb. 2011; and multiple Data Acquisition Band conference calls)
6.1 October 2014 (revised from change management process, change proposal approved by FIA Management Team; and multiple Data Acquisition Band conference calls)
7.0 October 2015 (revised from change management process, change proposals approved by FIA Management Team; multiple Data Acquisition Band conference calls, from Portland, OR, Data Acquisition Band Meeting, Feb. 2015; and from results of a field guide reorganization team)
7.1 October 2016 (revised from multiple Data Acquisition Band conference calls)
7.2 October 2017 (revised from the Pacific Northwest FIA Program's 2017 annual operations meeting and other meetings)
8.0 October 2018 (revised from change management process, change proposals approved by FIA Management Team, and multiple Data Acquisition Band conference calls.)
9.0 October 2019 (revised from change management process, change proposals approved by FIA Management Team, and multiple Data Acquisition Band conference calls.)

Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

INTRODUCTION

This document describes the standards, codes, methods, and definitions for Forest Inventory and Analysis (FIA) field data items. The objective is to describe CORE FIA field procedures that are consistent and uniform across all FIA units. **This CORE is the framework for regional FIA programs; individual programs may add variables, but may not change the CORE**

requirements. Unless otherwise noted, the items in this field guide are considered CORE, that is, the information will be collected by all FIA units as specified. Items or codes specified as CORE OPTIONAL are not required by individual units; however, if the item is collected or coded, it will be done as specified in this field guide. It is expected that on average all items in this guide (Volume I of the FIA field methods guide) can be measured by a two-person field crew in less than one day, including travel time to and from the plot.

The FIA program is in transition, changing in response to legislation and new customer demands. One of these demands is for increased consistency, which this field guide begins to address. Another change was the merger of the FIA program with the field plot component of the Forest Health Monitoring (FHM) program's Detection Monitoring. A systematic grid was established that includes some, but not all former FIA plots. This grid contains the Phase 2 plots, the annual survey plots that are designed for measurement on a rotation such that a portion of the plots are measured each year. The rotation length varies by region. The former FHM Detection Monitoring field plots are the Phase 3 plots, a subset of the Phase 2 plots. The same basic plot and sampling designs are used on all the plots.

The focus of Volume I is on data that are collected in the field on all Phase 2 plots in the FIA sample. The methods in Volume I are also used on Phase 3 plots except when specifically noted otherwise in the methods text. Volume II of the series describes an additional, expanded suite of data collected on the Phase 3 subset of plots. Volume II contains methods for the following indicators: ozone bioindicator plants; lichen communities; soils (physical and chemical characteristics); crown condition; and vegetation diversity and structure. Note that the down woody materials field procedures are now included only in Volume I. Volume III of the series (in preparation) will document the office procedures including data elements measured in the office, data from other sources that are merged into the FIA database, and CORE compilation and analysis algorithms. When complete, the three-volume set will describe the CORE FIA program field data, all of which are measured consistently across the country.

Field Guide Layout

Each section of the field guide corresponds to one of the following sections:

0 General Description
1 Plot Level Data
2 Condition Class
3 Subplot Information
4 Boundary References
5 Tree Measurements and Sapling Data
6 Seedling Data
7 Site Tree Information
8 Phase 2 (P2) Vegetation Profile (core optional)
9 Invasive Plants
10 Down Woody Materials

Each section begins with a general overview of the data elements collected at that level and background necessary to prepare field crews for data collection. Descriptions of data elements follow in this format:

DATA ELEMENT NAME -- <brief variable description>

When collected: <when data element is recorded>
Field width: <X digits>
Tolerance: <range of measurement that is acceptable>
MQO: <measurement quality objective>

Values: <legal values for coded variables>
Data elements, descriptions of when to collect the data elements, field width, tolerances, MQO's, and values, apply to both Phase 2 plots (formerly called FIA plots) and Phase 3 plots (formerly called FHM Detection Monitoring plots) unless specifically noted. Field width designates the number of columns (or spaces) needed to properly record the data element.

Tolerances may be stated in +/- terms or number of classes for ordered categorical data elements (e.g., +/- 2 classes); in absolute terms for some continuous variables (e.g., +/- 0.2 inches); or in terms of percent of the value of the data element (e.g., +/- 10 percent of the value). For some data elements, no errors are tolerated (e.g., PLOT NUMBER).

MQO's state the percentage of time that the collected data are required to be within tolerance. Percentage of time within tolerance is generally expressed as "at least X percent of the time," meaning that crews are expected to be within tolerance at least X percent of the time.

PLOT NOTES will be available on every PDR screen for ease in recording notes.

Units of Measure

The field guide will use ENGLISH units as the measurement system.

Plot Dimensions:

Subplot:

Radius = 24.0 feet
Area = 1,809.56 square feet or approximately 0.04 acre or approximately 1/24 acre

Microplot:

Radius = 6.8 feet
Area = 145.27 square feet or approximately 0.003 acre or approximately 1/300 acre

Macroplot:

Radius = 58.9 feet
Area = 10,899 square feet or 0.25 acre or 1/4 acre

Annular plot:

Radius = from 24.0 feet to 58.9 feet
Area = 9088.4 square feet or approximately 0.21 acre or 5/24 acre

The distance between subplot centers is 120.0 feet horizontal.
The minimum area needed to qualify as accessible forest land is 1.0 acre.
The minimum width to qualify as accessible forest land is 120.0 feet

Tree Limiting Dimensions:

breast height	4.5 feet
stump height	1.0 feet
merchantable top	4.0 inches DOB
merchantable top for woodland	1.5 inches DOB
minimum conifer seedling length	0.5 feet
minimum hardwood seedling length	1.0 feet
seedling/sapling DBH/DRC break	1.0 inch DOB
sapling/tree DBH/DRC break	5.0 inches DOB

0.0 General Description

The CORE field plot consists of four subplots approximately 1/24 acre in size with a radius of 24.0 feet. The center subplot is subplot 1. Subplots 2, 3, and 4 are located 120.0 feet horizontal (+/- 7 feet) at azimuths of 360, 120, and 240 degrees from the center of subplot 1, respectively (see fig. 1). Throughout this field guide, the use of the word 'plot' refers to the entire set of four subplots. 'Plot center' is defined as the center of subplot 1. As a CORE OPTION, the field plot may also include macroplots that are ¼ acre in size with a radius of 58.9 feet; each macroplot center coincides with the subplot's center. Macroplots are numbered in the same way as subplots.

If the macroplots are not installed, the subplots are used to collect data on trees with a diameter (at breast height, DBH, or at root collar, DRC) of 5.0 inches or greater. If the macroplots are installed, then subplots are used to collect data on trees from a diameter 5.0 inches to the breakpoint diameter and the macroplot is used to collect data on trees with diameter greater than the breakpoint diameter.

Each subplot contains a microplot of approximately 1/300 acre in size with a radius of 6.8 feet. The center of the microplot is offset 90 degrees and 12.0 feet horizontal (+/- 1 foot) from each subplot center. Microplots are numbered in the same way as subplots. Microplots are used to select and collect data on saplings (DBH/DRC of 1.0 inch through 4.9 inches) and seedlings (DBH/DRC less than 1.0 inch in diameter and greater than 0.5 foot in length [conifers] or greater than 1.0 foot in length [hardwoods]).

As a CORE OPTION for a Phase 2 plot that is not part of the Phase 3 subset, data for one or more of the Phase 3 indicators may be collected on the plot. If a region exercises the option to collect one or more Phase 3 indicator(s) on a Phase 2 only plot, the entire suite of measurements for the particular indicator(s) described in the appropriate chapter must be collected for the data for that indicator to be core optional.

Each unit may choose which Phase 3 indicators to collect as core optional on a Phase 2 plot that is not a Phase 3 plot. They may choose no indicators, all indicators or a subset. If they choose to collect data for a Phase 3 indicator, all the procedures for the indicator must be followed for that indicator to be considered core optional (data in the National Information Management System [NIMS]). If a subset of measurements for an indicator are collected, that is considered a regional enhancement and the data will be in the regional database.

Macroplots may be used to provide a better sample of rare population elements, such as very large trees.

The annular plot may be used for destructive sampling such as collecting soil samples. Also the term annular plot will be used for instructions in the field guide, for example, instructions on numbering trees when the macroplots are installed.

Data are collected on field plots at the following levels:

Plot	Data that describe the entire cluster of four subplots.
Subplot	Data that describe a single subplot of a cluster.
Condition Class	A discrete combination of landscape attributes that describe the environment on all or part of the plot. These attributes include CONDITION CLASS STATUS, RESERVED STATUS, OWNER GROUP, FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, and TREE DENSITY.

Boundary	An approximate description of the demarcation line between two condition classes that occur on a single subplot, microplot, or macroplot. There is no boundary recorded when the demarcation occurs beyond the fixed-radius plots.
Tree	Data describing saplings with a diameter 1.0 inch through 4.9 inches, and trees with diameter greater than or equal to 5.0 inches.
Seedling	Data describing trees with a diameter less than 1.0 inch and greater than or equal to 0.5 foot in length (conifers) or greater than or equal to 1.0 foot in length (hardwoods).
Site Tree	Data describing site index trees.

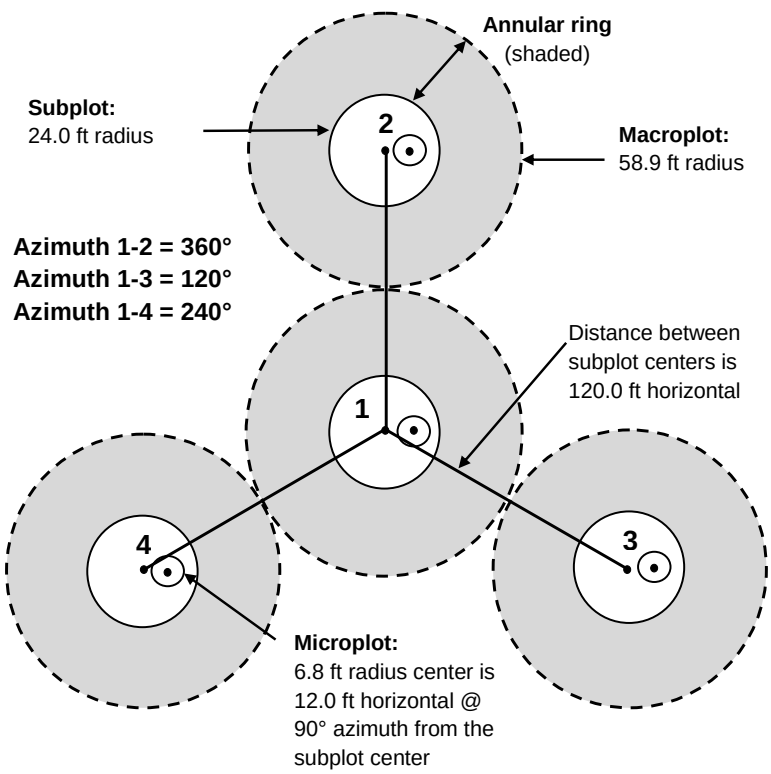


Figure 1. FIA Phase 2 plot diagram. See individual Phase 3 chapters for Phase 3 plot figures.

0.1 Plot Setup

Plots will be established according to the regional guidelines of each FIA unit. When the crew cannot occupy the plot center because safety hazards exist, or the plot center is inaccessible or out of the sample, the crew should check the other subplots. If any subplot centers can be occupied and are in the sample, the subplots that can be occupied should be established and sampled following normal procedures. When a subplot center or microplot center cannot be occupied, no data will be collected from that subplot or microplot; instead, the entire subplot or microplot should be classified according to the condition preventing occupancy.

The following table provided can assist in locating subplot 2-4 from a subplot other than subplot 1.

Subplot number from	**Subplot number to**	**Azimuth**	**Azimuth**	**Distance**
		degrees	***degrees***	***feet***
2	3	150	330	207.8
2	4	210	030	207.8
3	4	270	090	207.8

If a subplot was installed incorrectly at the previous visit, the current crew should remeasure the subplot in its present location and contact the field supervisor. In cases where individual subplots are lost (cannot be relocated), use the following procedures:

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

0.2 Plot Integrity

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

- Scribing and nailing tags on witness trees so that subplot centers can be relocated.
- Boring trees for age on subplots and macroplots to determine tree age, site index, stand age, or for other reasons.
- Nailing and tagging trees on microplots, subplots, and macroplots so that these trees can be identified and relocated efficiently and positively at times of remeasurement.
- Nailing, scribing, or painting microplot, subplot, and macroplot trees so that the point of diameter measurement can be accurately relocated and remeasured.

All other potentially damaging procedures that may erode subplot integrity are prohibited.
The following practices are specifically prohibited:

- Boring and scribing some specific tree species that are known to be negatively affected (e.g., the initiation of infection or callusing).

- Chopping vines from tally trees. When possible, vines should be pried off trunks to enable accurate measurement. If this is not possible, alternative tools (calipers, biltmore sticks) should be used.

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

1.0 Plot Level Data

All variables listed in Section 1.0 are collected on plots with at least one accessible forest land condition (PLOT STATUS = 1) and all NONFOREST/NONSAMPLED plots (PLOT STATUS = 2 or PLOT STATUS = 3). In general, plot level data apply to the entire plot and they are recorded from the center of subplot 1. A plot is considered nonforest if no part of it is currently located in forest land (CONDITION CLASS STATUS = 1). A plot is nonsampled if the entire plot is not sampled for one of the reasons listed in PLOT NONSAMPLED REASON.

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

Trees on previously forest land plots will be reconciled during data processing. There is a distinction between plots that have been clearcut, and plots that have been converted to another land use. A clearcut plot is considered to be forest land until it is actively converted to another land use. Additional information concerning land use classifications is contained in Section 2.3.

1.1 STATE

Record the unique FIPS (Federal Information Processing Standard) code identifying the State where the plot center is located.

Values: See Appendix 1

1.2 COUNTY

Record the unique FIPS (Federal Information Processing Standard) code identifying the county, parish, or borough (or unit in AK) where the plot center is located.

Values: See Appendix 1

1.3 PLOT NUMBER

Record the identification number, unique within a county, parish, or borough (survey unit in AK), for each plot. If SAMPLE KIND = 3, the plot number will be assigned by the National Information Management System (NIMS).

Values: 00001 to 99999

1.4 PLOT STATUS

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

Values:

Value	Description
1	Sampled – at least one accessible forest land condition present on plot
2	Sampled – no accessible forest land condition present on plot
3	Nonsampled – possibility of forest land

1.5 NONFOREST SAMPLING STATUS

Record whether this plot is part of a nonforest inventory. If NONFOREST SAMPLING STATUS = 1, then the entire suite of attributes that are measured on the forest lands will be measured and only those suites of attributes that are measured on forest lands will be measured on nonforest lands.

Values:

Value	Description
0	Nonforest plots / conditions are not inventoried
1	Nonforest plots / conditions are inventoried

1.6 NONFOREST PLOT STATUS

Record the code that describes the plot status of the nonforest plot, i.e., PLOT STATUS = 2. In cases where the plot is inaccessible, but obviously contains no nonforest land, i.e., plot is either noncensus water or census water, record NONFOREST PLOT STATUS = 2.

Values:

Value	Description
1	Sampled – at least one accessible nonforest land condition present on the plot
2	Sampled – no nonforest land condition present on plot, i.e., plot is either census and/or noncensus water
3	Nonsampled nonforest

1.7 PLOT NONSAMPLED REASON

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

Values:

Value	Description
01	Outside U.S. boundary – Entire plot is outside of the U.S. border.
02	Denied access – Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot. Because a denied-access plot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
03	Hazardous – Entire plot cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc. Although most hazards will not change over time, a hazardous plot remains in the sample and is re-examined at the next occasion to determine if the hazard is still present.
05	Lost data – Plot data file was discovered to be corrupt after a panel was completed and submitted for processing. This code is applied at the time of processing after notification to the units. This code is for office use only.
06	Lost plot – Entire plot cannot be found. Whenever this code is assigned, a replacement plot is required. The plot that is lost is assigned SAMPLE KIND = 2 and NONSAMPLED REASON = 6. The replacement plot is assigned SAMPLE KIND = 3.
07	Wrong location – Previous plot can be found, but its placement is beyond the tolerance limits for plot location. Whenever this code is assigned, a replacement plot is required. The plot being relocated is assigned SAMPLE KIND = 2 and

Value	Description
	NONSAMPLED REASON = 7. Its replacement plot is assigned SAMPLE KIND = 3.
08	Skipped visit – Entire plot skipped. Used for plots that are not completed prior to the time a panel is finished and submitted for processing. 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. A field note is required to describe the situation.
11	Ocean – Plot falls in ocean water below mean high tide line.

1.8 NONFOREST PLOT NONSAMPLED REASON

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

Values:

Value	Description
02	Denied access – Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot. Because a denied-access plot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
03	Hazardous – Entire plot cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc. Although most hazards will not change over time, a hazardous plot remains in the sample and is re-examined at the next occasion to determine if the hazard is still present.
08	Skipped visit – Entire plot skipped. Used for plots that 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. A field note is required to describe the situation.

1.9 SUBPLOTS EXAMINED

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

Values:

Value	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)

1.10 SAMPLE KIND

Record the code that describes the kind of plot being installed.

Values:

Value	Description
1	Initial plot establishment - the initial establishment and sampling of a national design plot (FIA Field Guide versions 1.1 and higher). SAMPLE KIND 1 is assigned under the following circumstances: • Initial activation of a panel or subpanel • Reactivation of a panel or subpanel that was previously dropped • Resampling of established plots that were not sampled at the previous visit
2	Remeasurement – remeasurement of a national design plot that was sampled at the previous inventory.
3	Replacement plot - a replacement plot for a previously established plot. Assign SAMPLE KIND = 3 if a plot is re-installed at a location other than the original location (i.e., plots that have been lost, moved, or otherwise replaced). Note that replacement plots require a separate plot file for the replaced plot. Replaced plots are assigned SAMPLE KIND = 2, PLOT STATUS = 3, and the appropriate NONSAMPLED REASON code. The plot number for the new (replacement) plot is assigned by NIMS.

1.11 PREVIOUS PLOT NUMBER

Record the identification number for the plot that is being replaced.

Values: 00001 to 99999

1.12 FIELD GUIDE VERSION

Record the version number of the National Core Field Guide that was used to collect the data on this plot. FIELD GUIDE VERSION will be used to match collected data to the proper version of the field guide.

Values: 9.0

1.13 CURRENT DATE

Record the year, month, and day that the current plot visit was completed as described in 1.13.1 – 1.13.3.

1.13.1 YEAR

Record the year that the plot was completed.

Values: $\geq$ 2003

1.13.2 MONTH

Record the month that the plot was completed.

Values:

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

1.13.3 DAY

Record the day of the month that the plot was completed.

Values: 01 to 31

1.14 DECLINATION (CORE OPTIONAL)

Record the azimuth correction used to adjust magnetic north to true north. All azimuths are assumed to be magnetic azimuths unless otherwise designated. The Portland FIA unit historically has corrected all compass readings for true north. This field is to be used only in cases where units are adjusting azimuths to correspond to true north; for units using magnetic azimuths, this field will always be set = 0 in the office. This field carries a decimal place because the USGS corrections are provided to the nearest half degree. DECLINATION is defined as:

DECLINATION = (TRUE NORTH - MAGNETIC NORTH)

Values: +/- 50

1.15 HORIZONTAL DISTANCE TO IMPROVED ROAD

Record the straight-line distance from plot center (subplot 1) to the nearest improved road. An improved road is a road of any width that is maintained as evidenced by pavement, gravel, grading, ditching, and/or other improvements.

Values:

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

1.16 WATER ON PLOT

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

Values:

Value	Description
0	None – no water sources within the accessible forest/nonforest land
1	Permanent streams or ponds too small to qualify as noncensus water
2	Permanent water in the form of deep swamps, bogs, marshes without standing trees present and less than 1.0 ac in size, or with standing trees
3	Ditch/canal – human-made channels used as a means of moving water, such as irrigation or drainage which are too small to qualify as noncensus water
4	Temporary streams
5	Flood zones – evidence of flooding when bodies of water exceed their natural banks
9	Other temporary water – specify in plot notes

1.17 QA STATUS

Record the code to indicate the type of plot data collected, using the following codes:

Values:

Value	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	Hot check (production plot)

1.18 CREW NUMBER

Record up to 5 crew numbers as assigned to the field crew; always record the crew leader first. The first 2 digits are for the responsible unit's station number (NRS – 24xxxx, SRS – 33xxxx, RMRS – 22xxxx, and PNW – 26xxxx).

Values:

Value	Description
NRS	240001 – 249999
SRS	330001 – 339999
RMRS	220001 – 229999
PNW	260001 - 269999

1.19 GPS Coordinates

Use a global positioning system (GPS) unit to determine the plot coordinates and elevation of all field-visited plot locations even if GPS has been used to locate the plot in the past.

1.19.1 GPS Unit Settings, Datum, and COORDINATE SYSTEM

Consult the GPS unit operating manual or other regional instructions to ensure that the GPS unit internal settings, including Datum and Coordinate system, are correctly configured. Each FIA unit will use the NAD83 Datum to collect coordinates.

Each FIA unit will determine which coordinate system to use. Regions using a Geographic system will collect coordinates in Degrees, Minutes, and Seconds of Latitude and Longitude; the regions using the UTM coordinate system will collect UTM Easting, Northing, and Zone.

1.19.2 Collecting Readings

Critical GPS settings such as maximum PDOP, maximum EHE, minimum satellite elevation, minimum SNR, and number of readings to average will be determined by each region based on recommendations from the Mobile Geospatial Technology Advisory Group (MGTAG) where available. These may be collected in a file for post-processing or may be averaged by the GPS unit.

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

If it is still not possible to get suitable coordinates from plot center, attempt to obtain them from a location within 200 feet of plot center. Obtain the azimuth and horizontal distance from the "offset" location to plot center. Record the azimuth and horizontal distance as described in Sections 1.19.14 and 1.19.15.

Coordinates may be collected further away than 200 feet from the plot center if a laser measuring device is used to determine the horizontal distance from the "offset" location to plot center. Record the azimuth and horizontal distance as described in Sections 1.19.14 and 1.19.15.

Coordinates not collected by automatic means shall be manually double-entered into the data recorder.

1.19.3 GPS UNIT

Record the kind of GPS unit used to collect coordinates. If suitable coordinates cannot be obtained, record 0.

Values:

Value	Description
0	GPS coordinates not collected
2	Models capable of field-averaging
3	Models capable of producing files that can be post-processed
4	Models not capable of field-averaging or post-processing

1.19.4 GPS SERIAL NUMBER

Record the last six digits of the serial number on the GPS unit used.

Values: 000001 to 999999

1.19.5 GPS ENTRY METHOD

Identify the method used to record GPS data. If GPS data are manually entered, record 0. If GPS data are transferred electronically from the GPS receiver to the data recorder, record 1.

Upon entering a 1 the following variables are automatically populated in accordance with the GPS receiver setup in 1.19.1 (coordinates LATITUDE, LONGITUDE or UTM, GPS ELEVATION, GPS ERROR, and NUMBER OF READINGS). All other GPS variables must be populated via manual key-entry.

Values:

Value	Description
0	GPS data manually entered
1	GPS data electronically transferred

1.19.6 GPS DATUM

Record the acronym indicating the map datum that the GPS coordinates are collected in (i.e., the map datum selected on the GPS unit to display the coordinates).

Values:

NAD83 North American Datum of 1983

1.19.7 COORDINATE SYSTEM

Record a code indicating the type of coordinate system used to obtain readings.

Values:

Value	Description
1	Geographic coordinate system
2	UTM coordinate system

1.19.8 Latitude

Record the latitude of the plot center to the nearest hundredth second, as determined by GPS.

Note: The following can be customized at the region level (e.g., decimal minutes to the nearest thousandth) as long as the final results recorded are within the specified tolerance to the nearest hundredth of a second or +/- 1.01 ft.

1.19.8.1 LATITUDE DEGREES

Record the latitude degrees of the plot center as determined by GPS.

Values: 0-90

1.19.8.2 LATITUDE MINUTES

Record the latitude minutes of the plot center as determined by GPS.

Values: 0 – 59

1.19.8.3 LATITUDE SECONDS

Record the latitude decimal seconds of the plot center to the nearest hundredth place as determined by GPS.

Values: 0.00 - 59.99

1.19.9 Longitude

Record the longitude of the plot center, to the nearest hundredth second, as determined by GPS.

Note: The following can be customized at the region level (e.g., decimal minutes to the nearest thousandth) as long as the final results recorded are within the specified tolerance to the nearest hundredth of a second or +/- 1.01 ft.

1.19.9.1 LONGITUDE DEGREES

Record the longitude degrees of the plot center as determined by GPS.

Values: 1-180

1.19.9.2 LONGITUDE MINUTES

Record the longitude minutes of the plot center as determined by GPS.

Values: 0 – 59

1.19.9.3 LONGITUDE SECONDS

Record the longitude decimal seconds of the plot center to the nearest hundredth place as determined by GPS.

Values: 0.00 – 59.99

1.19.10 UTM ZONE

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

Values: Number varies from 2 in Alaska to 19 on the East Coast. The letter varies from Q in Hawaii to W in Alaska.

1.19.11 EASTING (X) UTM

Record the Easting coordinate of the plot center as determined by GPS.

Values: 0000000 - 9999999

1.19.12 NORTHING (Y) UTM

Record the Northing coordinate of the plot center as determined by GPS.

Values: 0000000 - 9999999

1.19.13 Correction For "Offset" Location

As described in Section 1.19.2, coordinates may be collected at a location other than the plot center (an “offset” location). If the GPS unit is capable of calculating plot center coordinates then AZIMUTH TO PLOT CENTER and DISTANCE TO PLOT CENTER both equal 000.

1.19.14 AZIMUTH TO PLOT CENTER

Record the azimuth from the location where coordinates were collected to actual plot center. If coordinates are collected at plot center or are corrected in the field to plot center, record 000.

Values: 000 when coordinates **are** collected at plot center
001 to 360 when coordinates **are not** collected at plot center

1.19.15 DISTANCE TO PLOT CENTER

Record the horizontal distance in feet from the location where coordinates were collected to the actual plot center. If coordinates are collected at plot center or are corrected in the field to plot center, record 000. As described in Section 1.19.2, if a laser range finder is used to determine DISTANCE TO PLOT CENTER, offset locations may be up to 999 feet from the plot center. If a range finder is not used, the offset location must be within 200 feet.

Values: 000 when coordinates **are** collected at plot center
001 to 200 when a Laser range finder **is not** used to determine distance
001 to 999 when a Laser range finder **is** used to determine distance

1.19.16 GPS ELEVATION

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

Values: -00100 to +20000

1.19.17 GPS ERROR

Record the error as shown on the GPS unit to the nearest foot up to 999 feet.

Values: 000 - 999

1.19.18 NUMBER OF READINGS

Record a 3-digit code indicating how many readings were averaged by the GPS unit to calculate the plot coordinates.

Values: 001 to 999

1.19.19 GPS FILENAME (CORE OPTIONAL)

Record the filename containing the GPS positions collected on the plot.

Values: English words, phrases and numbers

1.20 MACROPLOT BREAKPOINT DIAMETER (CORE OPTIONAL)

When the macroplot core option is being utilized, record the value selected for breakpoint diameter for that particular plot. If macroplots are not being installed, this item will be left blank. 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. Examples of different breakpoint diameters used by western FIA units are 24 inches or 30 inches (Pacific Northwest), or 21 inches (Interior West). Installation of macroplots is core optional and is used to have a larger plot size in order to more adequately sample large trees.

Values: 21, 24, and 30

1.21 PLOT NOTES

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

Values: English language words, phrases and numbers

1.22 P2 Vegetation Sampling Options – Plot-Level Variables

The following options are set by the inventory unit prior to field season and are not set by field crews upon arriving at a plot. Therefore, each unit can customize the PDR program to automatically fill these variables. These variables are included to aid data management and allow various units to be compared appropriately.

1.22.1 P2 VEGETATION SAMPLING STATUS

This plot-level variable determines whether P2 Vegetation data will be recorded on the plot, and the land condition class(es) on which it will be recorded. The code used will be determined by regional needs. If P2 VEGETATION SAMPLING STATUS = 0, no further data collection is required within the P2 Vegetation field guide section.

Values:

Value	Description
0	Not sampling P2 Vegetation
1	P2 Vegetation data collected only on accessible forest land conditions (CONDITION CLASS STATUS = 1 and NONFOREST SAMPLING STATUS = 0)
2	P2 Vegetation data collected on all accessible land conditions (CONDITION CLASS STATUS=1 or NONFOREST CONDITION CLASS STATUS = 2)

1.22.2 LEVEL OF DETAIL

This plot-level variable determines whether data are collected for *Vegetation Structure* only or for *Species Composition* as well. If LEVEL OF DETAIL = 3, then a tree species could be recorded twice, but it would have two different SPECIES GROWTH HABITs (see 8.6.1).

Values:

Value	Description
1	Collect data for *Vegetation Structure* only; total aerial canopy cover and canopy cover by layer for tally tree species (all sizes), non-tally tree species (all sizes), shrubs/subshrubs/woody vines, forbs, and graminoids.
2	Collect *Vegetation Structure* data (LEVEL OF DETAIL = 1) **plus** understory *Species Composition* data including up to four most abundant species per SPECIES GROWTH HABIT per subplot of: seedlings and saplings of any tree species (tally or non-tally) <5 inches DBH (DRC for woodland species), non-tally tree species ≥5 inches DBH, shrubs/subshrubs/woody vines, forbs, and graminoids.
3	Collect *Vegetation Structure* data, understory *Species Composition* data (LEVEL OF DETAIL = 2), **plus** up to four most abundant tree species (tally or non-tally) ≥5 inches DBH (DRC for woodland species) per SPECIES GROWTH HABIT per subplot.

1.23 INVASIVE PLANT SAMPLING STATUS (Plot-level variable)

Determines whether invasive plant data will be recorded on the plot and the land class(es) on which it will be recorded.

Values:

Value	Description
0	Not collecting invasive plant data
1	Invasive plant data collected only on accessible forest land conditions (CONDITION CLASS STATUS = 1)
2	Invasive plant data collected on all accessible land conditions (CONDITION CLASS STATUS =1 or NONFOREST CONDITION CLASS STATUS=2)

1.24 INVASIVE PLANT SPECIMEN COLLECTION RULE (Plot-level variable)

Downloaded code to indicate if collection of specimens of unknown invasive species is required.

Values:

Value	Description
0	FIA unit does not require specimen collection for invasive plants
1	FIA unit requires specimen collection for invasive plants

1.25 Plot-Level Variables for DWM Protocol

The codes in this section define the type of variables and transect configuration used for measuring DWM. The variables will help define the design of previously-collected data and directly feed into compilation of expansion factors for measured DWM. These variables are predefined for an inventory and generally will be downloaded to the PDR.

1.25.1 DWM SAMPLING STATUS (BASE)

Record the code that describes whether DWM data will be recorded and which variables will be recorded. If code = 0, no further data collection is required within this manual section.

Values:

Value	Description
0	Not sampling DWM
1	BASE biomass DWM variables collected on measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2).
2	BASE biomass and wildlife/ecological package DWM variables collected on measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2). **Required for P3 DWM**
3	Rapid assessment DWM variables collected on measured land conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2).

1.25.2 DWM NUMBER OF SUBPLOTS (BASE)

Identify the number of subplots on which DWM is measured. When DWM SAMPLING STATUS = 1 or 2, number of subplots = 4. When DWM SAMPLING STATUS = 3, value can range from 1 to 4.

Values: 1 to 4

1.25.3 DWM NUMBER OF TRANSECTS ON SUBPLOT (BASE)

Identify the number of transects per subplot on which DWM is measured. A “transect” is defined as a line starting from subplot center and ending at or beyond the subplot boundary. When DWM SAMPLING STATUS = 1, number of transects per subplot = 2. When DWM SAMPLING STATUS = 2, number of transects per subplot = 2 or 3. When DWM SAMPLING STATUS = 3, value can range from 1 to 3.

Values: 1 to 3

1.25.4 DWM TRANSECT LENGTH (BASE)

Identifies the length of each transect on which DWM is measured. The minimum transect length when DWM SAMPLING STATUS >0 is 24.0 feet, measured to the nearest 0.1 foot. On plots where the core-optional condition classes are defined and measured on the macroplot, transect length can extend into the 58.9 foot macroplot. When DWM SAMPLING STATUS = 1 or 2, transect length equals 24 feet or 58.9 feet; when DWM SAMPLING STATUS = 3, the length can be some specified value between 24 feet and 58.9 feet (if conditions are mapped on the macroplot).

Values: 24.0 to 58.9 feet

1.25.5 DWM SUBPLOT LIST (BASE)

Identifies the subplots on which DWM is measured. When DWM SAMPLING STATUS = 1 or 2, subplots = 1234. When DWM SAMPLING STATUS = 3, value can range from 1000 to 4000.

Values: 1000 to 4000

1.25.6 DWM NOTES (BASE)

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

Values: English language words, phrases and numbers

2.0 CONDITION CLASS

The Forest Inventory and Analysis (FIA) plot is cluster of four subplots in a fixed pattern. Subplots are never reconfigured or moved in order to confine them to a single condition class; a plot may straddle more than one condition class. Every plot samples at least one condition class: the condition class present at plot center (the center of subplot 1).

2.1 Determination of Condition Class

2.1.1 Step 1: Delineate the plot area by CONDITION CLASS STATUS

The first attribute considered when defining a condition class is CONDITION CLASS STATUS. The area sampled by a plot is assigned to condition classes based upon the following differences in CONDITION CLASS STATUS:

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

Accessible forest land defines the population of interest for FIA purposes. This is the area where most of the data collection is conducted. Additionally, nonforest land is sampled in some areas of special interest.

2.1.2 Step 2: Further subdivide Accessible Forest Land by 6 delineation variables

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

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

At time of re-inventory, one additional attribute, PRESENT NONFOREST LAND USE, is used to define new condition classes if the sampled area on a plot has changed from accessible forest land to nonforest land (Note: see Section 2.5.30). This allows tracking of land use changes without requiring mapping of all nonforest land condition classes on all plots.

No other attribute shall be the basis for recognizing contrasting accessible forest land condition classes. For each condition class recognized, several “ancillary attributes” that help describe the condition will be collected, but will not be used for delineation purposes (see Section 2.3.1).

2.1.3 Step 3: When inventorying Nonforest Land, delineate accessible Nonforest Land by 3 delineation variables

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

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

2.2 Condition Class Status Definitions

1. Accessible Forest Land

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

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

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

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

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

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

When a forest land condition encroaches into a nonforest land condition, the border between forest and nonforest is often a gradual change in tree cover with no clear and abrupt boundary. In addition, it may be difficult to determine exactly where the forested area meets the minimum cover criteria and where it does not. For these situations, determine where the land clearly meets the 10 percent minimum canopy cover, and where it clearly is less than required cover; divide the zone between these points in half, and determine the side of the zone on which the subplot center is located. Classify the condition class of the subplot based on this line (fig. 2), using the class criteria above.

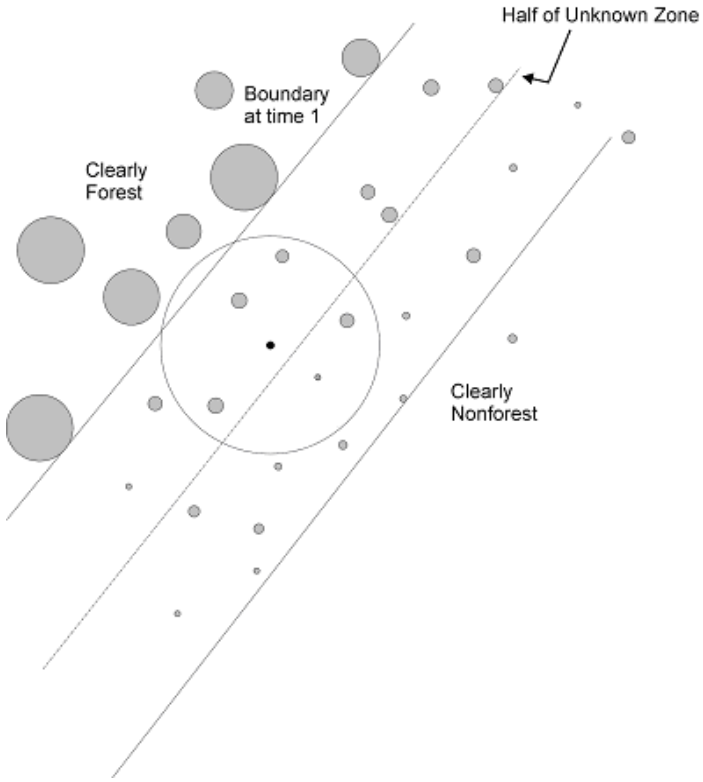


Figure 2. Example of classifying the condition class of the subplot in a transition zone with forest/nonforest encroachment.

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

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

Indistinct boundary due to the condition minimum-width definition – Do not subdivide subplots where a condition class may change due only to the forest vs. nonforest minimum width (120.0 feet) definition. Although the point where the definition changes from forest to nonforest creates an invisible “line” between conditions, **this definitional boundary is not distinct and obvious**. See figures 3 and 4. Where the point of the definition change occurs on the subplot, determine only if the subplot center is on the forest or nonforest side of that approximate boundary, and

classify the entire subplot based on the condition of the subplot center. If the boundary crosses through the center of the subplot, classify the subplot as the condition it most resembles. If the boundary occurs between subplots, classify each subplot based on its relation to the definitional boundary.

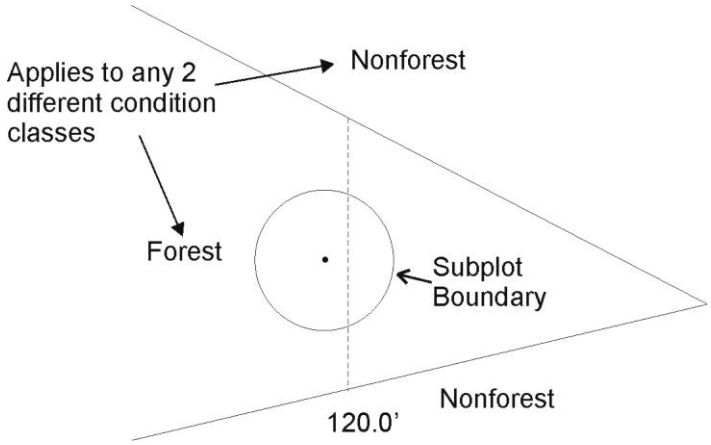


Figure 3. Forest condition narrows within a nonforest land condition. Examine the location of the subplot center in reference to the approximate line where the forest narrows to 120.0 ft wide. In this example, the entire subplot is classified as forest.

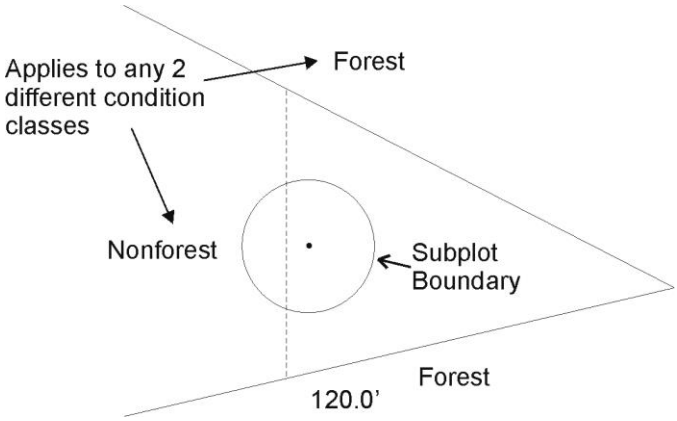


Figure 4. Nonforest land condition narrows within a forest condition. Examine the location of the subplot center in reference to the approximate line where the nonforest narrows to 120.0 ft wide. In this example, the entire subplot is classified as forest.

2. Nonforest Land

Land that has less than 10 percent canopy cover of tally tree species of any size (live + missing) and, in the case of afforested land, fewer than 150 established trees per acre; OR land that has sufficient canopy cover or stems, but is classified as nonforest land use (see criteria under PRESENT NONFOREST LAND USE). Nonforest includes areas that have sufficient cover or live stems to meet the Forest Land definition, but do not meet the dimensional requirements. All conditions not meeting the requirements of forest land will be assigned a PRESENT NONFOREST LAND USE CODE.

Other Wooded Land – Other wooded land has at least 5 percent, but less than 10 percent, canopy cover of live tally tree species of any size or has had at least 5 percent, but less than 10 percent, canopy cover of tally species in the recent past, based on the presence of stumps, snags, or other evidence. Other wooded land is recognized as a subset of nonforest land, and therefore is not currently considered a separate condition class. Additionally, the condition is not subject to nonforest use(s) that prevent normal tree regeneration and succession, such as regular mowing, intensive grazing, or recreation activities. In addition, other wooded land is classified according to the same nonforest land use rules as forest land (e.g., 6 percent cover in an urban setting is not considered other wooded land). Other wooded land is therefore defined as having ≥5 percent and <10 percent canopy cover at present, or evidence of such in the past, and PRESENT NONFOREST LAND USE CODE = 20, 40, 42, 43 or 45.

3. Noncensus Water
Lakes, reservoirs, ponds, and similar bodies of water 1.0 acre to 4.5 acres in size. Rivers, streams, canals, etc., 30.0 feet to 200 feet wide.

4. Census Water
Lakes, reservoirs, ponds, and similar bodies of water 4.5 acres in size and larger; and rivers, streams, canals, etc., more than 200 feet wide (1990 U.S. Census definition).

5. Nonsampled, possibility of forest
See section 2.4.3 CONDITION NONSAMPLED REASON for descriptions of land that qualifies as nonsampled. In cases where a condition is access-denied or hazardous land use, but obviously contains no forest land, record CONDITION CLASS STATUS = 2, 3 or 4. In cases where a condition is access-denied or hazardous land use and has the possibility of forest, record CONDITION CLASS STATUS = 5.

2.3 Condition Class Attributes

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

2.3.1 Forest Land

For each condition class classified as accessible forest land, a classification is required for each of the following attributes:

2.5.1	RESERVED STATUS	Attributes where a change causes a separate condition class
2.5.2	OWNER GROUP	
2.5.3	FOREST TYPE	
2.5.4	STAND SIZE CLASS	
2.5.5	REGENERATION STATUS	
2.5.6	TREE DENSITY	
2.5.7	OWNER CLASS	Ancillary - changes do not delineate a new condition class
2.5.13	ARTIFICIAL REGENERATION SPECIES	
2.5.14	STAND AGE	
2.5.15	DISTURBANCE (up to 3 coded)	
2.5.16	DISTURBANCE YEAR (1 per disturbance)	
2.5.21	TREATMENT (up to 3 coded)	
2.5.22	TREATMENT YEAR (1 per treatment)	
2.5.27	PHYSIOGRAPHIC CLASS	
2.4.3	FOREST LAND CONDITION STATUS CHANGE	

2.5.29 PRESENT NONFOREST LAND USE (for area converted from accessible forest land condition class to nonforest land since last inventory).

2.3.2 Nonforest Land

For each condition class classified as nonforest land, a classification is required for each of the following attributes:

2.5.1	RESERVED STATUS	Attributes where a change causes a separate condition class
2.5.2	OWNER GROUP	
2.5.29	PRESENT NONFOREST LAND USE	

2.5.7	OWNER CLASS	Ancillary - changes do not delineate a new condition class
2.5.15	DISTURBANCE (up to 3 coded)	
2.5.16	DISTURBANCE YEAR (1 per disturbance)	
2.5.21	TREATMENT (up to 3 coded)	
2.5.22	TREATMENT YEAR (1 per treatment)	
2.5.27	PHYSIOGRAPHIC CLASS	
2.4.3	FOREST LAND CONDITION STATUS CHANGE	

2.4 Delineating Condition Classes Differing In Condition Class Status:

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

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

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

Five exceptions to these size and width requirements apply:

1. Developed nonforest land condition: human-caused nonforest land condition classes such as homes or cabins that are less than 1.0 acre in size and 120.0 feet in width and are surrounded by forest land. There are three kinds of developed nonforest land conditions that do not have to meet area or width requirements (fig. 5).

    (a) Improved roads: paved roads, gravel roads, or improved dirt roads regularly maintained for long-term continuing use. Unimproved traces and roads created for skidding logs are not considered improved road.

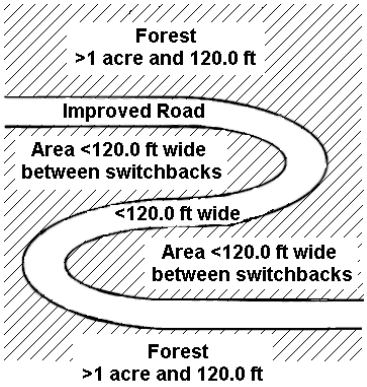


Figure 5. Example of a switchback road. All the cross-hatched area is forest and the improved road is a nonforest condition.

(b) Maintained rights-of-way: corridors created for railroads, power lines, gas lines, and canals that are periodically treated to limit the establishment and growth of trees and shrubs.

(c) Developments: structures and the maintained area next to a structure, all less than 1.0 acre in size and surrounded by forest land. Examples of developments are houses or trailers on very small lots, communication installations in a small cleared area within forest land, and barns and sheds.

2. Distinct, alternating strips of forest and nonforest land: this situation occurs when a plot or subplot samples a condition class that is less than 1.0 acre in size and less than 120.0 feet in width. The condition class is one of a series of parallel strips of forest and nonforest land in which none of the strips meet the minimum width requirement. This exception applies only to nonforest land conditions that are not listed under #1, e.g., improved roads, maintained rights-of-way, and developments.

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

(b) Two alternating strips: For two alternating strips of forest and nonforest between two qualifying areas of nonforest land and forest land, see figure 6. Figure 6 delineates the boundary between the forest and nonforest land condition classes for four different examples. The plot center defines the plot condition for all strips covered by the arrow. Any subplot that falls in the alternating strips uses the rule. Any subplot that falls in assigned nonforest / forest is assigned that type. Again, this exception applies only to nonforest land conditions that are not listed under number 1, e.g., improved roads, maintained rights-of-way, and developments.

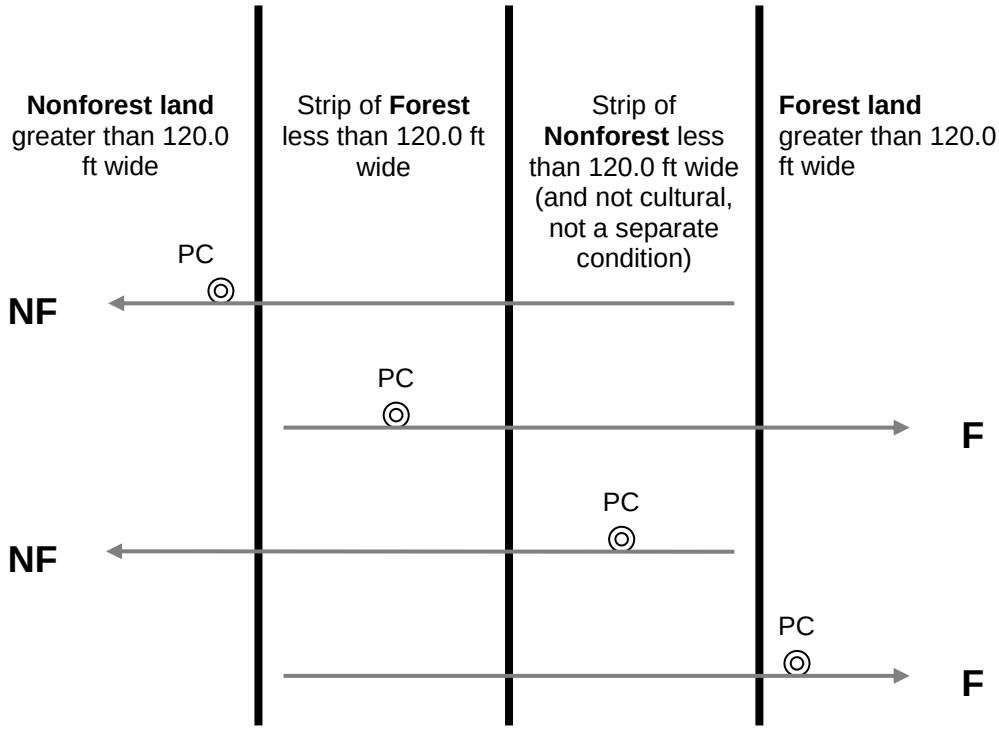


Figure 6. Example of alternating strips of forested and nonforested conditions. PC is the plot center (center of subplot 1).

3. The 120.0-foot minimum width for delineation does not apply when a corner angle is 90 degrees or greater (fig. 7).

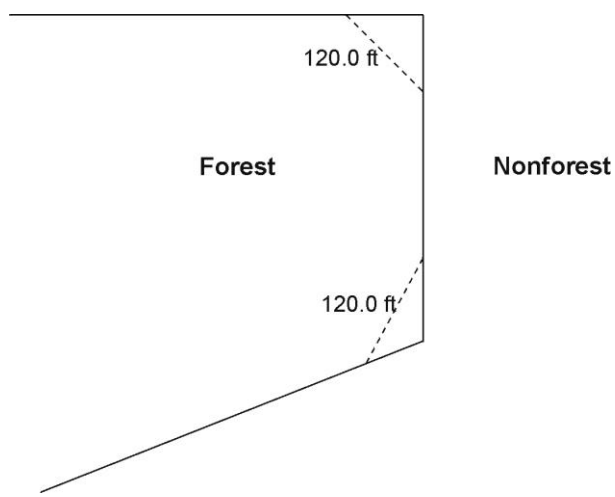


Figure 7. Illustration of the 90 degree corner rule. The dotted lines do not create nonforest land conditions.

4. Linear water features: natural water features that are linear in shape such as streams and rivers. A linear water feature must meet the definition for census or noncensus water to be nonforest area. Therefore, a linear water feature must be at least 30.0 feet wide and cover at least 1.0 acre. The width of a linear water feature is measured across its channel between points on either side up to which water prevents the establishment and survival of trees. To determine whether a linear water feature qualifies as nonforest, rely on all available information on hand such as aerial photos, topographic maps, past survey land calls, and ocular estimates at the current survey visit. Linear water features that do not meet the definition for census or noncensus water should be classified as forest land only if bounded by forest land on both shores. Crews are NOT expected to measure the length of a linear water feature to determine if it meets the 1.0 acre requirement; use professional judgment and common sense on any linear water feature.

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

2.4.1 CONDITION CLASS NUMBER

On a plot, assign and record a number for each condition class. The condition class at plot center (the center of subplot 1) is designated condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated.

Values: 1 to 9

2.4.2 CONDITION CLASS STATUS

Record the code that describes the sampling status of the condition class. The instructions in Sections 2.3 and 2.4 apply when delineating condition classes that differ by CONDITION CLASS STATUS. In situations where a condition is denied access or hazardous, but obviously contains no forest land, record CONDITION CLASS STATUS = 2, 3 or 4. In cases where a condition is access-denied or hazardous land use and has the possibility of forest, record CONDITION CLASS STATUS = 5.

Values:

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

2.4.3 FOREST LAND CONDITION STATUS CHANGE – New Forest Condition or Loss of Previous Forest Condition

Field protocol change, physical change on the ground, and crew error can all have an effect on new forested conditions moving onto a plot or previously forested conditions being reclassified to a condition status other than forest land between field visits. The purpose of this variable is to identify what caused:

1. A new forested condition to be recognized on the plot,

And / Or

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

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

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

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

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

All forested conditions that remain forested between visits 1 and 2 (regardless if their area has expanded or contracted on the plot) would be coded as FOREST LAND CONDITION STATUS CHANGE = 0, as would new CONDITION CLASS STATUS = 2, 3, or 4 conditions that are NOT the direct result of a previous forest condition no longer qualifying as forest land.

Values:

Value	Description
0	No change – the condition is not a new forested condition nor is it a new condition that is the result of a previously forested condition no longer qualifying as such or the condition was previously not field visited or was previously classified as non-sampled.
1	Physical changes - condition status changed due to actual on-the-ground physical change either natural or human-caused.
2	Crew error - condition status changed due to a previous crew's error.
3	Procedural changes – condition status changed due to a change in variable definition or procedures.

2.4.4 CONDITION NONSAMPLED REASON

For portions of plots that cannot be sampled (CONDITION CLASS STATUS = 5), record one of the following reasons.

Values:

Value	Description
01	Outside U.S. boundary – Assign this code to condition classes beyond the U.S. border.
02	Denied access area – Any area within the sampled area of a plot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. There are no minimum area or width

Value	Description
	requirements for a condition class delineated by denied access. Because a denied-access condition can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
03	Hazardous situation – Any area within the sampled area on plot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present. There are no minimum size or width requirements for a condition class delineated by a hazardous condition.
05	Lost data – Plot data file was discovered to be corrupt after a panel was completed and submitted for processing. Used for the single condition that is required for this plot. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 05. This code is for office use only.
06	Lost plot – Entire plot cannot be found. Used for the single condition that is required for this plot. Used only in conjunction with PLOT NONSAMPLED REASON code 06. Can be either generated by the data recorder or in the office.
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. Used only in conjunction with PLOT NONSAMPLED REASON code 07. Can be either generated by the data recorder or in the office.
08	Skipped visit – Entire plot skipped. Used for the single condition that is required for this plot. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 08. This code is for office use only.
09	Dropped intensified plot – Used for the single condition that is required for this plot. Used only by units engaged in intensification. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 09. This code is for office use only.
10	Other – This code is used whenever a condition class is not sampled due to a reason other than one of the specific reasons listed. A field note is required to describe the situation.
11	Ocean – Condition falls in ocean water below mean high tide line.

2.4.5 NONFOREST CONDITION CLASS STATUS

Record the code that describes the sampling status of the condition class (see the nonforest nonsampled reasons below for additional information).

Values:

Value	Description
2	Accessible nonforest land
5	Nonsampled nonforest

2.4.6 NONFOREST CONDITION NONSAMPLED REASON

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

Values:

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

2.5 Delineating Condition Classes Within Accessible Forest Land:

Accessible forest land is subdivided into condition classes that are based on differences in RESERVED STATUS, OWNER GROUP, FOREST TYPE, STAND SIZE CLASS, REGENERATION STATUS, and TREE DENSITY. Section 2.1 applies when delineating contrasting forest condition classes. Specific criteria apply for each of the six attributes and are documented by attribute in 2.5.1 to 2.5.6. “Stands” are defined by plurality of stocking for all live trees, saplings, and seedlings that are not overtopped.

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

No other attribute shall be the basis for recognizing contrasting condition classes within accessible forest land. For each condition class recognized, many “ancillary attributes” that help describe the condition will be collected, but will not be used for delineation purposes (see Sections 2.5.7 to 2.5.23).

General instructions for delineating condition classes within accessible forest lands:

1. <u>Distinct boundary within a macroplot (if applicable), subplot, or microplot</u> – Separate condition classes ARE recognized if, within a subplot, two (or more) distinctly different condition classes are present and delineated by a distinct, abrupt boundary. The boundary is referenced; see Section 4.0.

2. <u>Indistinct boundary within a subplot</u> – Separate condition classes are NOT recognized if the prospective condition classes abut along an indistinct transition zone, rather than on an abrupt, obvious boundary. Only one condition is recognized, and the subplot is classified entirely as the condition it most resembles.

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

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

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

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

4. Riparian forest area – A riparian forest area is defined as a forest area between 30.0 and 120.0 feet wide, and 1.0 acre or more in size, cumulative, and adjacent to but not necessarily present on both sides of a naturally occurring or artificially created body of water or watercourse with continuous or intermittent flow. Riparian forest areas may be associated with but not limited to streams, rivers, lakes, sloughs, seeps, springs, marsh, bogs, beaver ponds, sink holes, cypress domes and ponds, man-made ditches and canals. A riparian forest area must be associated “within forest” and contain at least one distinct and obvious change in a condition class delineation attribute from its adjacent accessible forest land condition class. Figures 8-13 provide examples of when to delineate riparian forest area as a separate condition class.

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

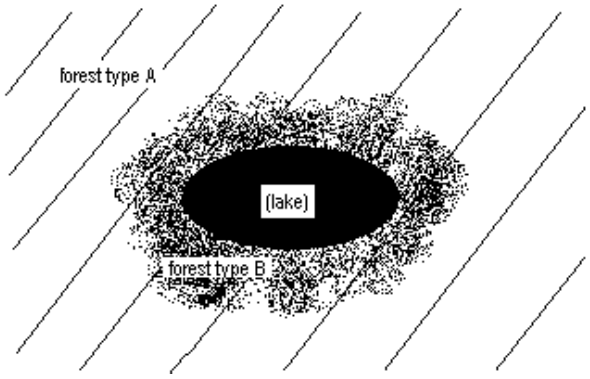


Figure 8. Forest type B is a separate condition class (riparian) if the band of it is between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

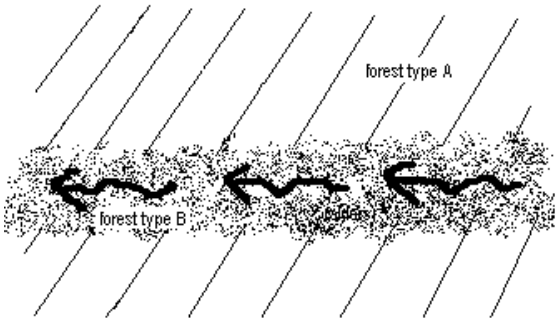


Figure 9. Forest type B is a separate condition class (riparian) if the band of it is between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

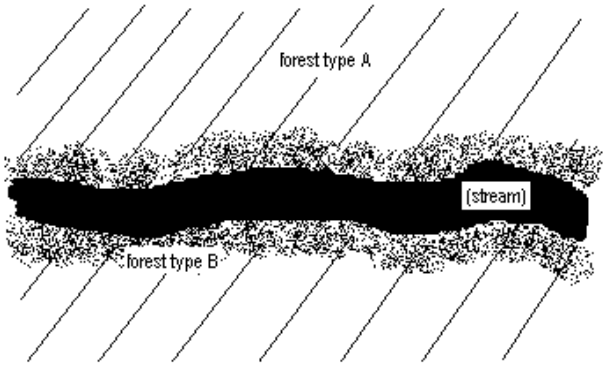


Figure 10. If the stream is < 30.0 feet wide, forest type B is a separate condition class (riparian) if the sum of the two widths of the bands, including the stream falls between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

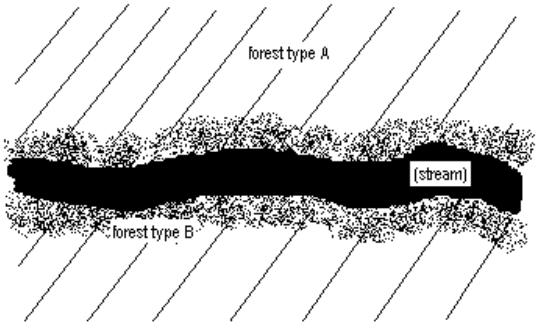


Figure 11. If the stream is > 30.0 feet wide, forest type B is a separate condition class (riparian) if either of the two widths of the bands falls between 30.0 feet and 120.0 feet wide and is ≥ 1.0 acre in size.

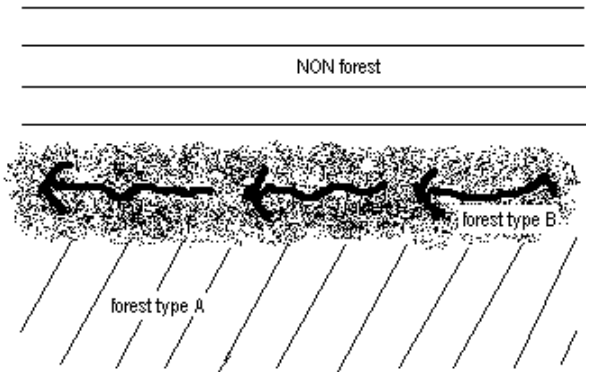


Figure 12. Forest type B is a separate condition class (riparian) if the band of it is between 30.0 feet and 120.0 feet wide, and is ≥ 1.0 acre in size.

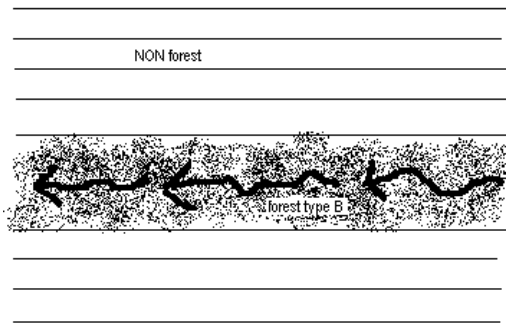


Figure 13. In a nonforested area, a band of forest type B that is < 120.0 feet wide is NOT considered a riparian area. It is not a separate condition class at all.

2.5.1 RESERVED STATUS

Record the code that identifies the reserved designation for the condition. Reserved land is withdrawn by law(s) prohibiting the management of land for the production of wood products (not merely controlling or prohibiting wood-harvesting methods). Such authority is vested in a public agency or department, and supersedes rights of ownership. The prohibition against management for wood products cannot be changed through decision of the land manager (management agency) or through a change in land management personnel, but rather is permanent in nature.

Ownership and the name (designation) of an area are critical for determining reserved status. All private lands (OWNGRPCD = 40) are considered not reserved (due to difficulty in determining legal status); this includes in-holdings, where they can be identified. FIA has adopted a default national list of federal land designations which are considered reserved (see appendix 12). All federally-owned lands managed by the National Park Service or Fish and Wildlife Service (OWNCD = 21 or 23) are considered reserved. Some lands owned by State or local governments are considered reserved, even in the absence of specific laws covering them, if the agency mandate for that land designation precludes management to produce wood products (e.g., most State Parks). In the absence of State-specific lists of reserved areas, any State or local government land area that includes “park”, “wilderness”, “wild river”, “reserve”, or “preserve” in the name is by default considered reserved. There are less common designations that are not on the CORE list and units may add exceptions to the list for specific areas that are managed under different legal guidance than is usual for that designation. All designations must be documented using the RESERVED AREA NAME field. Note that harvest can occur in reserved areas, for example for restoration, safety, or recreation.

For the core optional procedure, nonforest areas are reserved if forest lands in the same designated area are considered reserved, or if the area would be considered reserved if forestland was present.

Values:

Value	Description
0	Not reserved
1	Reserved

2.5.2 OWNER GROUP

Record the OWNER GROUP code identifying the ownership (or the managing Agency for public lands) of the land in the condition class. Conditions will be delineated based on changes in OWNER GROUP only; separate conditions due to changes in OWNER GROUP are recognized only where differences can be clearly identified on the ground when visiting the plot.

Values:

Value	Description
10	Forest Service
20	Other Federal
30	State and Local Government
40	Private

2.5.3 FOREST TYPE

Record the code corresponding to the FOREST TYPE (from Appendix 2) that best describes the species with the plurality of stocking for all live trees in the condition class that are not overtopped. Note: Canopy cover is used to determine whether an area is forest or nonforest. Stocking is used with other variables such as this one.

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

- For SAMPLE KIND = 2 plots, record the FOREST TYPE of the condition at the previous inventory.
- For all other plots:
  1. Evaluate any seedlings available to determine the FOREST TYPE.
  2. If no seedlings exist, use adjacent stands and your best professional judgment to determine FOREST TYPE.

Values: See Appendix 2

The instructions in Sections 2.1 and 2.4 apply when delineating, within accessible forest land, contrasting conditions based on differences in FOREST TYPE.

2.5.4 STAND SIZE CLASS

Record the code that best describes the predominant size class of all live trees, seedlings and saplings in the condition class. Note: Canopy cover is used to determine whether an area is forest or nonforest. Stocking is used with other variables such as this one.

Values:

Value	Description
0	Nonstocked Meeting the definition of accessible forest land, and one of the following applies: (a) less than 10 percent stocked by trees, seedlings, and saplings, and not classified as cover trees, or (b) for several woodland species where stocking standards are not available, less than 10 percent **canopy cover** of trees, seedlings, and saplings.
1	≤ 4.9 inches (seedlings / saplings) At least 10 percent stocking (or 10 percent canopy cover if stocking standards are not available) in trees, seedlings, and saplings; and at least 2/3 of the canopy cover is in trees less than 5.0 inches DBH/DRC.
2	5.0 – 8.9 inches (softwoods) / 5.0 – 10.9 inches (hardwoods) At least 10 percent stocking (or 10 percent canopy cover if stocking standards are not available) in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than 5.0 inches DBH/DRC **and** the plurality of the canopy cover is in softwoods between 5.0 – 8.9 inches diameter and/or hardwoods between 5.0 – 10.9 inches DBH, and/or woodland trees 5.0 – 8.9 inches DRC.
3	9.0 – 19.9 inches (softwoods) / 11.0 – 19.9 inches (hardwoods) At least 10 percent stocking (or 10 percent canopy cover if stocking standards are not available) in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than 5.0 inches DBH/DRC **and** the plurality of the canopy cover is in softwoods between 9.0 – 19.9 inches diameter and/or hardwoods between 11.0 – 19.9 inches DBH, and/or woodland trees 9.0 – 19.9 inches DRC.
4	20.0 – 39.9 inches At least 10 percent stocking (or 10 percent canopy cover if stocking standards are not available) in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than 5.0 inches DBH/DRC **and** the plurality of the canopy cover is in trees between 20.0 – 39.9 inches DBH.
5	40.0 + inches At least 10 percent stocking (or 10 percent canopy cover if stocking standards are not available) in trees, seedlings, and saplings; and at least 1/3 of the canopy cover is in trees greater than 5.0 inches DBH/DRC **and** the plurality of the canopy cover is in trees ≥40.0 inches DBH.

The instructions in Sections 2.1 and 2.4 apply when delineating, on accessible forest land, contrasting conditions based on differences in STAND SIZE CLASS.

Within the sampled area on microplot, subplot, or macroplot, recognize only very obvious contrasting stands of different mean diameter with an abrupt boundary. Example: an obvious abrupt boundary exists within the sampled (fixed-radius) area of a subplot and demarcates a STAND SIZE CLASS change. Use tree stocking of all live trees, seedlings, and saplings that are not overtopped to differentiate between stand-size classes; for most woodland forest types (e.g., pinyon, juniper, gambel oak) where stocking standards are not readily available, use percent tree cover to represent stocking.

When using canopy cover as the surrogate for stocking to determine STAND SIZE CLASS, view the plot from the top down and examine canopy cover. The stand must have at least 10 percent of the canopy cover in STAND SIZE CLASSES of 1, 2, 3, 4, or 5 or any combination of these STAND SIZE CLASSES; otherwise the STAND SIZE CLASS is 0. If 2/3 of the canopy cover is STAND SIZE CLASS = 1, classify the condition as STAND SIZE CLASS = 1. If less than 2/3 of the canopy cover is STAND SIZE CLASS = 1, classify the condition as STAND SIZE CLASS = 2, 3, 4, or 5, based on which of these STAND SIZE CLASSES has the most canopy cover.

2.5.5 REGENERATION STATUS

Record the code that best describes the artificial regeneration that occurred in the condition.

Values:

Value	Description
0	Natural – present stand shows no clear evidence of artificial regeneration. Includes unplanted, recently cut lands
1	Artificial – present stand shows clear evidence of artificial regeneration

The instructions in section 2.1 and 2.4 apply when delineating, within accessible forest land, contrasting conditions based on differences in REGENERATION STATUS.

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

Note: Plot records or verbal evidence from landowner is acceptable for determining regeneration status.

2.5.6 TREE DENSITY

Record a code to indicate the relative tree density classification. Base the classification on the number of stems/unit area, basal area, tree cover, or stocking of all live trees, seedlings, and saplings in the condition that are not overtopped, compared to any previously defined condition class TREE DENSITY.

The instructions in Sections 2.1 and 2.4 apply when delineating, within accessible forest land, contrasting conditions based on differences in TREE DENSITY.

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

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

Values:

Value	Description
1	Initial density class
2	Density class 2 - density different than 1
3	Density class 3 - density different than 1 and 2

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

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

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

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

Ancillary (Non-Delineating) Variables

2.5.7 OWNER CLASS

Record the OWNER CLASS code that best corresponds to the ownership (or the managing Agency for public lands) of the land in the condition class. Conditions will **NOT** be delineated based on changes in OWNER CLASS. If multiple OWNER CLASSes occur within a condition class (i.e., within an OWNER GROUP), record the OWNER CLASS closest to the center of the lowest numbered subplot in the condition.

Values:

Owner Classes within Forest Service Lands (Owner Group 10)

11 National Forest
12 National Grassland and/or Prairie
13 Other Forest Service land

Owner Classes within Other Federal Lands (Owner Group 20)

21 National Park Service
22 Bureau of Land Management
23 Fish and Wildlife Service
24 Departments of Defense/Energy
25 Other Federal

Owner Classes within State and Local Government Lands (Owner Group 30)

31 State including state public universities
32 Local (County, Municipality, etc.) including water authorities
33 Other Non Federal Public

Owner Classes within Private lands (Owner Group 40)

41 Corporate, including Native Corporations in Alaska and private universities
42 Non Governmental Conservation / Natural Resources Organization Examples: Nature Conservancy, National Trust for Private Lands, Pacific Forest Trust, Boy Scouts of America, etc.
43 Unincorporated Partnerships / Associations / Clubs. Examples: Hunting Clubs that own, **not lease** property, recreation associations, 4H, churches etc.
44 Native American (Indian) – within reservation boundaries
45 Individual and Family, including trusts, estates, and family partnerships

2.5.8 OWNER SUB-CLASS (CORE OPTIONAL)

Record the OWNER SUB-CLASS code that best corresponds to the ownership (or the managing Agency for public lands) of the land. Currently, there are sub-classes for only the State category, but other sub-classes may be added in the future.

Values:

Value	Description
1	State forestry agency
2	State wildlife agency
3	State park agency
4	Other state lands

2.5.9 PUBLIC ADMINISTRATIVELY WITHDRAWN STATUS (CORE OPTIONAL)

Record the code that best corresponds to the administratively withdrawn designation for the condition. Conditions will NOT be delineated based on this variable; if multiple administratively withdrawn status types occur on a single condition class, record the administratively withdrawn status closest to the plot center. Administratively withdrawn land is public land withdrawn by management plans or government regulations prohibiting the management of land for the production of wood products (not merely controlling or prohibiting wood-harvesting methods). Such plans and regulations are formally adopted by land managers and the prohibition against management for wood products cannot be changed through decision of the land manager except by a formal modification of management plans or regulations.

Values:

Value	Description
0	Not administratively withdrawn
1	Administratively withdrawn

2.5.10 ADMINISTRATIVELY WITHDRAWN AREA NAME (CORE OPTIONAL)

Record the specific name of the area that identifies the administratively withdrawn designation for the condition. If a drop-down list is provided in the PDR, either select the correct name or select “Other” and type the correct name in the CONDITION NOTES field.

Values: English language words, phrases, and numbers

2.5.11 ADMINISTRATIVELY WITHDRAWN NOTES (CORE OPTIONAL)

Describe the source of the information used to classify Administratively Withdrawn Status, the method used to assign the information to individual conditions, the geographic area (e.g. states and counties), condition status, and owner class combinations to which the designation was applied, and date stamp for which the information is current.

Values: English language words, phrases and numbers

2.5.12 RESERVED AREA NAME

Record the specific name of the area that identifies the reserved designation for the condition. If a drop-down list is provided in the PDR, either select the correct name or select “Other” and type the correct name in the notes field.

Values: English language words, phrases, and numbers

2.5.13 ARTIFICIAL REGENERATION SPECIES

Record the species code of the predominant tree species for which evidence exists of artificial regeneration in the stand. This attribute is ancillary; that is, contrasting condition classes are never delineated based on variation in this attribute.

Values: See Appendix 3

2.5.14 STAND AGE

Record the average total age, to the nearest year, of the trees (plurality of all live trees, seedlings, and saplings not overtopped) in the predominant STAND SIZE CLASS of the condition, determined using local procedures. Record 000 for nonstocked stands. Note: Canopy cover is used to determine whether an area is forest or nonforest. Stocking is used with other variables such as this one.

An estimate of STAND AGE is required for every forest land condition class defined on a plot. Stand age is usually highly correlated with stand size and should reflect the average age of all trees that are not overtopped. Unlike the procedure for site tree age (TREE AGE AT DIAMETER), estimates of STAND AGE should estimate the time of tree establishment (e.g., not age at the point of diameter measurement). Note: For planted stands, estimate age based on the year the stand was planted (e.g., do not add in the age of the planting stock).

To estimate STAND AGE, select two or three dominant or codominant trees from the overstory. If the overstory covers a wide range of tree sizes and species, try to select the trees accordingly, but it is not necessary to core additional trees in such stands. The variance associated with mean stand age increases with stand heterogeneity, and additional cores are not likely to improve the estimate. Core each tree at the point of diameter measurement and count the rings between the outside edge and the core to the pith. Add in the number of years that passed from germination until the tree reached the point of core extraction to determine the total age of the tree. Unless more specific information is provided at training or by the unit, add 5 years to all eastern species, 5 years to western hardwoods, and 10 years to western softwoods. Assign a weight to each core by visually estimating the percentage of total overstory trees it represents. Make sure the weights from all cores add up to 1.0, compute the weighted average age, and record. For example, if three trees aged 34, 62, and 59 years represent 25 percent, 60 percent, and 15 percent of the overstory, respectively, the weighted stand age should be:

(34 x 0.25) + (62 x 0.60) + (59 x 0.15) = 55 years.

In some cases, it may be possible to avoid coring trees to determine age. If a stand has not been seriously disturbed since the previous survey, simply add the number of years since the previous inventory to the previous STAND AGE. In other situations, cores collected from site trees can be used to estimate STAND AGE.

If a condition class is nonstocked, assign a STAND AGE of 000.

If all of the trees in a condition class are of a species which, by regional standards, cannot be bored for age (e.g., mountain mahogany, tupelo) record 998. This code should be used in these cases only.

If tree cores are not counted in the field, but are collected and sent to the office for the counting of rings, record 999. Note on the core the percent of stand that type of core represents so that STAND AGE can be calculated later.

Values: 000 to 997, 998, 999

2.5.15 DISTURBANCE 1

Record the code corresponding to the presence of the following disturbances. Disturbance can connote positive or negative effects. The area affected by any natural or human-caused disturbance must be at least 1.0 acre in size. Record up to three different disturbances per condition class from most important to least important. This attribute is ancillary; that is, contrasting conditions are never delineated based on variation in this attribute.

For initial plot establishment (SAMPLE KIND =1 or 3), the disturbance must be within the last 5 years. For remeasured plots recognize only those disturbances that have occurred since the previous inventory.

Disturbance codes require "significant threshold" damage, which implies mortality and/or damage to 25 percent of all trees in a stand or 50 percent of an individual species' count. Additionally, some disturbances affect land and/or vegetation, but initially may not affect vegetation growth or health (e.g., grazing, browsing, flooding, etc.). In these cases, a disturbance should be coded when at least 25 percent of the soil surface or understory vegetation has been affected.

Values:

Value	Description
00	None - no observable disturbance
10	Insect damage
11	Insect damage to understory vegetation
12	Insect damage to trees, including seedlings and saplings
20	Disease damage
21	Disease damage to understory vegetation
22	Disease damage to trees, including seedlings and saplings
30	Fire (from crown and ground fire, either prescribed or natural)
31	Ground fire
32	Crown fire
40	Animal damage
41	Beaver (includes flooding caused by beaver)
42	Porcupine
43	Deer/ungulate
44	Bear (CORE OPTIONAL)

Value	Description
45	Rabbit (CORE OPTIONAL)
46	Domestic animal/livestock (includes grazing)
50	Weather damage
51	Ice
52	Wind (includes hurricane, tornado)
53	Flooding (weather induced)
54	Drought
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 listed or in the TREATMENT codes listed. Must include a condition-level note to describe further.
90	Geologic disturbances
91	Landslide
92	Avalanche track
93	Volcanic blast zone
94	Other geologic event
95	Earth movement/avalanches

2.5.16 DISTURBANCE YEAR 1

Record the year in which DISTURBANCE 1 occurred. If the disturbance occurs continuously over a period of time, record 9999.

Values: Since the previous plot visit, or the past 5 years for plots visited for the first time; 9999

2.5.17 DISTURBANCE 2

Record the second disturbance here. See DISTURBANCE 1 for coding instructions.

2.5.18 DISTURBANCE YEAR 2

Record the year in which DISTURBANCE 2 occurred. See DISTURBANCE YEAR 1 for coding instructions.

2.5.19 DISTURBANCE 3

Record the third disturbance here. See DISTURBANCE 1 for coding instructions.

2.5.20 DISTURBANCE YEAR 3

Record the year in which DISTURBANCE 3 occurred. See DISTURBANCE YEAR 1 for coding instructions.

2.5.21 TREATMENT 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. This attribute is ancillary; that is, contrasting conditions are never delineated based on variation in this attribute.

For initial plot establishment (SAMPLE KIND = 1 or 3), the treatment must be within the last 5 years. For remeasured plots recognize only those treatments that have occurred since the previous inventory.

Values:

Value	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% 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% 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 covered by codes 10-40) designed to improve the commercial value of the residual stand, or chaining, which is a practice used on woodlands to encourage wildlife forage.

2.5.22 TREATMENT YEAR 1

Record the year in which TREATMENT 1 occurred.

Values: Since the previous plot visit, or the past 5 years for plots visited for the first time

2.5.23 TREATMENT 2

If a stand has experienced more than one treatment, record the second treatment here. See TREATMENT 1 for coding instructions; code 00 if none.

2.5.24 TREATMENT YEAR 2

Record the year in which TREATMENT 2 occurred. See TREATMENT YEAR 1 for coding instructions.

2.5.25 TREATMENT 3

If a stand has experienced more than two treatments, record the third treatment here. See TREATMENT 1 for coding instructions; code 00 if none.

2.5.26 TREATMENT YEAR 3

Record the year in which TREATMENT 3 occurred. See TREATMENT YEAR 1 for coding instructions.

2.5.27 PHYSIOGRAPHIC CLASS

Record the code that best describes the PHYSIOGRAPHIC CLASS of the condition within the plot area; land form, topographic position, and soil generally determine physiographic class. The codes are organized by moisture regime:

- **Xeric** - Sites that are normally low or deficient in moisture available to support vigorous tree growth. These areas may receive adequate precipitation, but experience a rapid loss of available moisture due to runoff, percolation, evaporation, etc.
- **Mesic** Sites that have moderate but adequate moisture available to support vigorous tree growth except for periods of extended drought. These sites may be subjected to occasional flooding during periods of heavy or extended precipitation.
- **Hydric** Sites that generally have a year-round abundance or over-abundance of moisture. Hydric sites are very wet sites where excess water seriously limits both growth and species occurrence.

Values:

Moisture Regime	Value	Description
Xeric	11	Dry Tops - Ridge tops with thin rock outcrops and considerable exposure to sun and wind.
Xeric	12	Dry Slopes - Slopes with thin rock outcrops and considerable exposure to sun and wind. Includes most steep slopes with a southern or western exposure.
Xeric	13	Deep Sands - Sites with a deep, sandy surface subject to rapid loss of moisture following precipitation. Typical examples include sand hills, sites along the beach and shores of lakes and streams, and many deserts.
Xeric	19	Other Xeric - All dry physiographic sites not already described.
Mesic	21	Flatwoods - Flat or fairly level sites outside flood plains. Excludes deep sands and wet, swampy sites.
Mesic	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.
Mesic	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.
Mesic	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.
Mesic	25	Broad Flood plains/Bottomlands - Flood plains and bottomlands 1/4 mile or wider in width along rivers and streams. These sites are normally well drained but are subjected to occasional flooding during periods of heavy or extended precipitation. Includes associated levees, benches, and terraces. Excludes swamps, sloughs, and bogs with year-round water problems.
Mesic	29	Other Mesic - All moderately moist physiographic sites not already described.

Moisture Regime	Value	Description
Hydric	31	Swamps / Bogs - Low, wet, flat forested areas usually quite extensive that are flooded for long periods of time except during periods of extreme drought. Excludes cypress ponds and small drains.
Hydric	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.
Hydric	33	Bays and wet pocosins - Low, wet, boggy sites characterized by peaty or organic soils. May be somewhat dry during periods of extended drought. Examples include the Carolina bays in the southeast US.
Hydric	34	Beaver ponds
Hydric	35	Cypress ponds
Hydric	39	Other hydric - All other hydric physiographic sites.

2.5.28 COVER CLASS

Record this variable for all mapped conditions. As with 2.4.2 CONDITION CLASS STATUS, COVER CLASSes must meet the minimum area and width requirements (except those cases where the condition has been defined due to one of the exceptions to the size and width requirements. If the condition is less than 1 acre, then apply the key to the condition. In order to assign a single cover class to a mapped condition that contains more than one candidate cover class, proceed as follows: if no prospective cover classes meet the minimum width and area requirements, apply the key to the acre area that is within the condition being evaluated and closest to the lowest numbered subplot center associated with the condition. If multiple cover classes (i.e., those which meet minimum area and width requirements) exist in the condition, assign the first cover class that is encountered to the condition. As with other condition attributes, inclusions (of less than 1 acre) within the condition should be ignored when assigning the COVER CLASS. Therefore, areas of the inclusion within the acre area are ignored when making the relative cover assessments. Apply the key as a guide and/or to verify the COVER CLASS selection.

Assignment of COVER CLASS code is hierarchical in nature, and should be performed using the following hierarchical key. Following the guidance of the key, codes should be examined in succession, and the first definition that describes the area of the condition should be chosen. For example, if an area has 15% tree cover that is taller than the 50% shrub cover, it is classified as class **01 (Tree Cover)**. Note: Tree Cover is not equivalent to Forestland (e.g., a recent clearcut could be Forestland, but would not be Tree Cover). Vegetative cover, as used below, includes the area of ground covered by the vertical projection of the live plant canopy (or other vegetation components like flowers, basal structures or vines) on the area defined by the condition. If foliage is absent due to senescence or dormancy, the cover should be estimated based on the position of plant remains or other evidence of the foliar distribution during the growing season. If vegetation rooted outside of a condition is hanging over the condition being evaluated, it is considered in the cover calculations. If burned, then classify based on the remaining live vegetation, including the canopy cover of remaining live trees and shrubs.

When the surface of a condition is covered by deep non-permanent snow, ice, or water, and/or a condition is defined as CONDITION CLASS STATUS 5 (denied access or hazardous), field crews should use aerial imagery, local knowledge, and field observations to best determine COVER CLASS.

Full Cover Class Definitions

- **Dominant**: Refers to the highest (tallest) life form present, typically trees, then shrubs, then herbaceous layers.
- **Predominant**: Refers to the cover class with the highest percent cover in the condition.
- **Vegetated:** Contains at least 10% live vegetation cover.
- **Sparsely Vegetated:** Does not contain at least 10% live vegetation cover

Cover Classification Key

Follow the key in sequence. **If a class described the condition, <u>then look no further</u>**.

1. ≥10% live vegetative cover = **Vegetated**, else 2.

1.1 Areas on which live trees provide 10% or greater canopy cover and are part of the dominant (uppermost) vegetation layer, including areas that have been planted to produce woody crops = **01 Tree Cover**

1.2 Areas on which live shrubs provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer = **02 Shrub Cover**

1.3 Areas on which live herbaceous vegetation (including seasonally senescent cover) provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer = **03 Herbaceous Cover**

1.4 Areas on which non-vascular vegetation provide 10% or greater cover and are part of the dominant vegetation layer = **04 Non-vascular Vegetation Cover**

1.5 Areas with 10% or greater live vegetative cover but no one life form has 10% or more cover = **05 Mixed Vegetation Cover**

2. <10% live vegetative cover = **Sparsely Vegetated**

2.1 Areas persistently and predominantly covered by water (census and noncensus water, permanent snow and ice) and with less than 10% cover of emergent vegetation = **10 Water**

2.2 Areas predominantly covered with constructed materials with limited plant life = **09 Impervious**

2.3 Areas predominantly covered by bare rock, gravel, sand, silt, clay, or other earthen material, which contains <10% vegetation cover regardless of its inherent ability to support life = **08 Barren**

Values:

Codes are ≥10% vegetative cover:

Value	Description
01	**Tree Cover**: Areas on which live trees provide 10% or greater canopy cover and are part of the dominant (uppermost) vegetation layer, including areas that have been planted to produce woody crops, Christmas trees, orchards, etc. Only include tree species that that are listed in Appendix 3 after taking into account the three exclusion zones (see variable 5.8 SPECIES). Varieties and subspecies are tallied

Value	Description
	at the species level and hybrids are based on the dominant external characteristics. Species not included in Appendix 3 are considered shrub cover. Example areas include forests, forest plantations, reverting fields with ≥10% tree canopy cover, clearcuts with ≥10% tree canopy cover. This category includes cypress swamps and mangroves (not to be confused with aquatic vegetation).
02	**Shrub Cover:** Areas on which live shrubs or subshrubs provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer, provided these areas do not qualify as Tree Cover. **Shrub/Subshrub** — a woody plant that generally has several erect, spreading, or prostrate stems which give it a bushy appearance. This includes dwarf shrubs, and low or short woody vines (NVCS 2008) and excludes any species on FIA's tree list. Examples include cranberry bogs, berry crops, and other shrub-dominated wetlands, chaparral, and sagebrush.
03	**Herbaceous Cover:** Areas on which live herbaceous vegetation (including seasonally senescent cover) provides 10% or greater cover and are part of the dominant (uppermost) vegetation layer, provided these areas do not qualify as Tree Cover or Shrub Cover. This includes herbs, forbs, and graminoid species. Examples include meadows, prairies, croplands (while crops are present), and improved pasture. This category also includes emergent wetland vegetation like seasonally flooded grasslands, cattail marshes, etc.
04	**Non-vascular Vegetation Cover:** Areas on which non-vascular vegetation provides 10% or greater cover and are part of the dominant vegetation layer, provided these areas do not qualify as Tree Cover, Shrub Cover, or Herbaceous Cover. Examples include mosses, sphagnum moss bogs, liverworts, hornworts, lichens, and algae.
05	**Mixed Vegetation Cover:** Areas with 10% or greater live vegetative cover but no one life form has 10% or more cover. That is, these areas do not qualify as Tree Cover, Shrub Cover, Herbaceous Cover, or Non-vascular Vegetation Cover, and thus are a mixture of plant life forms. Examples can include early stages of reverting fields and high deserts,

Codes are < 10% live vegetation cover:

Value	Description
08	**Barren:** Areas predominately covered by bare rock, gravel, sand, silt, clay, or other earthen material, which contains <10% vegetation cover regardless of its inherent ability to support life. Examples include naturally barren areas such as lava fields, gravel bars, sand dunes, salt flats, deserts, playas, and rock outcroppings, as well as areas of bare soil exposed by land clearing (including plowed, harvested, or planted but not emerged cropland), wildfire, and other forms of disturbance. Also includes minerals and other geologic materials exposed by surface mining and roads made of dirt and gravel.
09	**Impervious:** Areas predominantly covered with constructed materials that contain < 10% vegetation cover. Examples include paved roads, parking lots, driveways, sidewalks, rooftops and other man-made structures.
10	**Water**: Areas persistently covered and predominated by water and have <10% emergent vegetative cover. Examples include census and noncensus water, and permanent snow and ice. For example, only the open water portion of a bog is to be included.

2.5.29 PRESENT NONFOREST LAND USE

Record this attribute for every nonforest condition class sampled. Recognizing multiple nonforest conditions on a plot is not required unless conducting a nonforest inventory (NONFOREST

SAMPLING STATUS = 1); or when areas that were sampled and classified at last inventory as accessible forest land and are now nonforest or partially nonforest land. For those areas that have changed from forest to nonforest, this variable is used to track land use change. Conversions from forest to nonforest become new nonforest conditions whenever they occur, except when a previously defined nonforest condition has expanded into an adjacent previously defined forest condition. This expanded condition will be captured through boundary changes on respective subplots and does not constitute a new separate condition. Instructions in Sections 2.1 and 2.4 apply.

Values:

Value	Description
10	Agricultural land - Land managed for crops, pasture, or other agricultural use. The area must be at least 1.0 acre in size and 120.0 feet wide (with the exception of windbreak/shelterbelt, which has no minimum width.) Use the 10 code only for cases not better described by one of the following: 11, 12, 13, 14, 15, 16, or 17.
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 - Land primarily composed of grasses, forbs, or shrubs. This includes lands vegetated naturally or artificially to provide a plant cover managed like native vegetation and does not meet the definition of pasture. The area must be at least 1.0 acre in size and 120.0 feet wide.
30	Developed - Land used primarily by humans for purposes other than forestry or agriculture. Use the 30 code only for land not better described by one of the following: 31, 32, 33, or 34.
31	Cultural: business (industrial/commercial), residential, and other places of intense human activity.
32	Rights-of-way: improved roads, railway, power lines, maintained canal
33	Recreation: parks, skiing, golf courses
34	Mining
40	Other - Land parcels greater than 1.0 acre in size and greater than 120.0 feet wide, which do not fall into one of the uses described above. Examples include undeveloped beaches, barren land (rock, sand), marshes, bogs, ice, and snow. Use the 40 code only for cases not better described by one of the following: 41, 42, 43, or 45.
41	Nonvegetated
42	Wetland
43	Beach
45	Nonforest-Chaparral

2.5.30 CANOPY COVER SAMPLE METHOD

Record the CANOPY COVER SAMPLE METHOD used to determine LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER for the condition. If the ocular method is not used, the appropriate plot-based method should be selected according to the condition's dimensions and shape.

Ocular method - The Ocular method is only used in areas that are obviously 0% LIVE PLUS MISSING CANOPY COVER or obviously greater than 10% LIVE PLUS MISSING CANOPY COVER. In addition to visual inspections of what is on the ground, crews can also use various

types of aerial imagery to help determine LIVE CANOPY COVER and LIVE PLUS MISSING CANOPY COVER values using this method. The Ocular method may also be used on condition status 2 plots where access to the nonforest landcover area may be limited or the nonforest condition is a developed non-forest land use. Note that when the Ocular method is used, it is likely to be easier for the observer to ignore subplot boundaries and assess the percentage of tree canopy cover over the condition in question, without regard to the locations of the stems supporting the canopy over the plot.

Subplot method - The Subplot method is used when the ocular method is not appropriate and in cases where the terrain, vegetation, and dimensions of a condition or the size of the field crew DO NOT allow a safe or practical sample using the acre method.

1. To estimate cover using the subplot method, the crew measures the crowns of all live trees, seedlings, and saplings on each of the four 1/24 acre subplots. To estimate total stems per acre, stems ≥5.0 inches diameter are counted on the subplots and stems <5.0 inches diameter are counted only on the four 1/300 acre microplots located 90 degrees and 12.0 feet from the subplot centers. The sample may consist of any combination of regular subplots and/or phantom subplots, provided all subplots fall entirely in the questionable condition.

2. Install phantom subplots as necessary to yield four 1/24-acre sample areas that fall entirely within the questionable condition. Record the location of these phantom or temporary subplots on your four point plot sketch and monument. Establish phantom subplots using the following protocol (fig. 14):

    a. Begin by locating the phantom subplots using the “highest” numbered regular subplot that falls in the questionable condition (e.g., 4 is the highest numbered regular subplot, next 3 and then 2). The phantom subplots are located in the following fashion (1) 120.0 feet at 360 degrees, (2) 120.0 feet at 120 degrees, then (3) 120.0 feet at 240 degrees.
    b. If this fails to yield 4 subplots that fall entirely within the questionable condition, install the remaining phantom subplots off the next highest numbered regular subplot that falls in the questionable condition.
    c. If this fails to produce a suitable location, rotate the phantom subplot off the other phantom subplots in the attempted order of installation until 4 subplots have been located in the questionable condition.

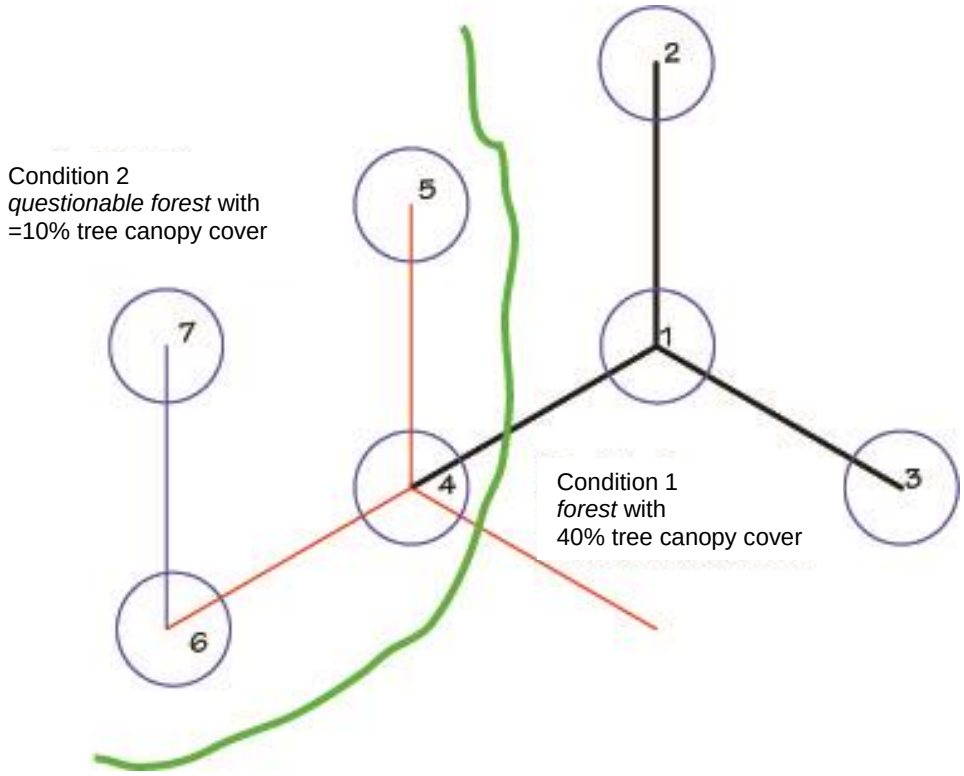


Figure 14. Example of the subplot method phantom subplots.

3. The Subplot method uses a 1/6-acre sample, so it would require a total of 726 ft^2 of LIVE PLUS MISSING CANOPY COVER to reach 10% threshold and be sampled as accessible forestland.

Acre method - The Acre method is used when the ocular method is not appropriate and when it is safe and practical to sample on the entire acre.

1. To determine if minimum 10% LIVE PLUS MISSING CANOPY COVER is reached (4356 sq ft), the crew samples all live, dead, and missing tree canopies on the one-acre sample plot (117.75 foot radius) as described above in LIVE PLUS MISSING CANOPY COVER.
2. If the 10% LIVE PLUS MISSING CANOPY COVER threshold is met and there is additional LIVE PLUS MISSING CANOPY COVER on the acre plot, crews can estimate the remaining LIVE PLUS MISSING CANOPY COVER using the ocular method.
3. As with the subplot method, the sample acre (117.75 foot radius plot) must fall entirely in the questionable condition.

Percent Canopy Cover Calculation for Acre method:

If a condition is close to 10% canopy cover, and other methods may not accurately represent tree canopy cover due to irregular spatial distribution of tree canopies (e.g., *clumpiness*), the Acre method provides another estimate of the total tree canopy area within the radius of a 1-acre plot located within the condition in question.

Given:

1. The area of an acre is 43,560 $ft^{2.}$
2. A 1-acre circle has a radius of 117.75 ft.
3. 10% of 1-acre is 4,356 ft^2.

and assuming the canopies to be ellipses:

1. Measure the approximate canopy diameter (long axis and short axis) for each tree on the acre.
2. Calculate the canopy area for each tree as Canopy Area = pi*((long axis diameter/2)*(90 degrees axis diameter/2)).
3. Add up the Canopy Areas, and divide by 435.6 (1% of an acre) to obtain percent cover (truncate)

Transition zones and forest/nonforest encroachment – When an accessible forest land condition encroaches into a nonforest condition, the border between forest and nonforest is often a gradual change in tree cover with no clear and abrupt boundary. This may cause difficulties determining exactly where the forested area meets the minimum canopy cover or stem count criteria. For these cases, determine where the land clearly meets the minimum requirements, and where it clearly is less than required. Divide the zone between these points in half, and determine the side of the zone on which the subplot center is located. Classify the condition class of the subplot based on this line.

If the Acre plot falls on or very near a transition, the Acre plot should be moved into the condition identified at plot center (fig. 15).

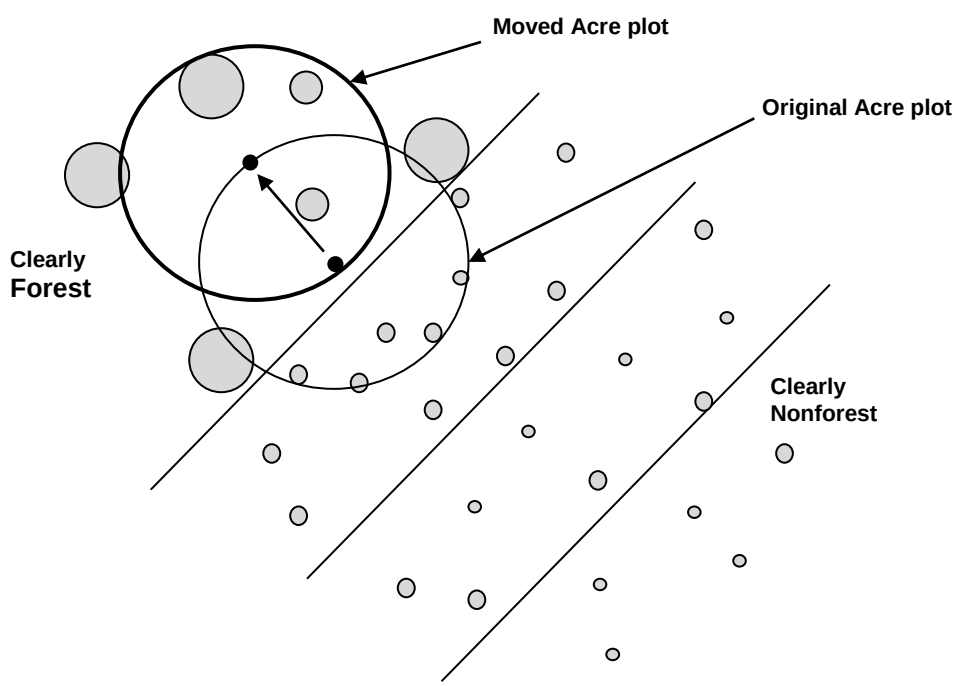


Figure 15. Example of using the Acre plot method when determining CANOPY COVER when the Acre plot is in a transition zone with forest/nonforest encroachment.

For example, at measurement time 1, a clear and distinct boundary existed between the forest and nonforest condition classes. At time 2, however, there now exists a zone of regeneration or small diameter trees between the previous forest condition and where the nonforest clearly remains. If the zone of encroachment meets cover / stem count criteria where it meets the nonforest, classify the entire zone as forest. If the zone is clearly nonforest up to the original stand, call it all nonforest. If the encroachment or transition zone does not clearly meet cover / stem count criteria where it meets the nonforest, determine where the land clearly meets the minimum requirements, and where it clearly is less than required. Divide the zone between these points in half, and classify the entire subplot based on which side of the line the subplot center falls.

Sub-acre method - The Sub-Acre method is *only* used when the ocular method is not appropriate and *only* when the acre or subplot methods cannot be established due to the condition's shape, dimensions or accessibility.

1. Ensure that the canopy cover sample area is representative of the condition in question.
2. Determine if minimum 10% LIVE PLUS MISSING CANOPY COVER is reached. The crew samples all live, dead, and missing tree canopies on the canopy cover sample plot as described above in LIVE PLUS MISSING CANOPY COVER. The 10% threshold is dependent on the sample plot size and respective area in square feet.
3. If the 10% LIVE PLUS MISSING CANOPY COVER threshold is met and there is additional LIVE PLUS MISSING CANOPY COVER on the sub-acre plot, crews can estimate the remaining LIVE PLUS MISSING CANOPY COVER using the ocular method.
4. As with the acre and subplot method, the sub-acre sample plot(s) must fall entirely in the questionable condition.
5. Potential circular plot sizes and appropriate scaling factors:

Acre Fraction	Radius (ft)	Area (sq ft)	10% Cover (sq ft)
1	117.7	43,560	4356
1/2	83.3	21,780	2178
1/3	68.0	14,520	1452
1/4	58.9	10,890	1089
1/5	52.7	8,712	872
1/6	48.1	7,260	726

Values:

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

2.5.31 LIVE CANOPY COVER

Record the percentage of LIVE CANOPY COVER for the condition. Include live tally trees, saplings, and seedlings that cover the sample area. For conditions where the LIVE CANOPY COVER is low and there is a question whether it meets 10 percent LIVE CANOPY COVER, the crew will measure every crown width within the canopy cover sample area. When the 10%

threshold is determined by measuring crown widths, the crew can use the ocular method to determine the total LIVE CANOPY COVER value.

Canopy widths are measured using the ellipse formula for calculation of canopy area. This requires two measurements. The first measurement is the long axis diameter. The second measurement is made at 90 degrees to the first measurement at the widest point of the crown (fig. 16). Canopy area = pi*((long axis diameter/2)*(90 degrees axis diameter/2)).

- Do not include the crown portion of trees, saplings, or seedlings that are vertically overtopped by other trees, saplings or seedlings.
- Only include tree canopy measurements from trees with stems that originate within the sample area, although canopy measurements can extend outside the sample area.
- Occasionally, a branch may protrude abnormally, but the lateral crown line is drawn across the portion of the branch which includes the “normal outline” of the tree.
- For leaning trees, ocularly upright the trees and measure crowns as if the trees were upright.

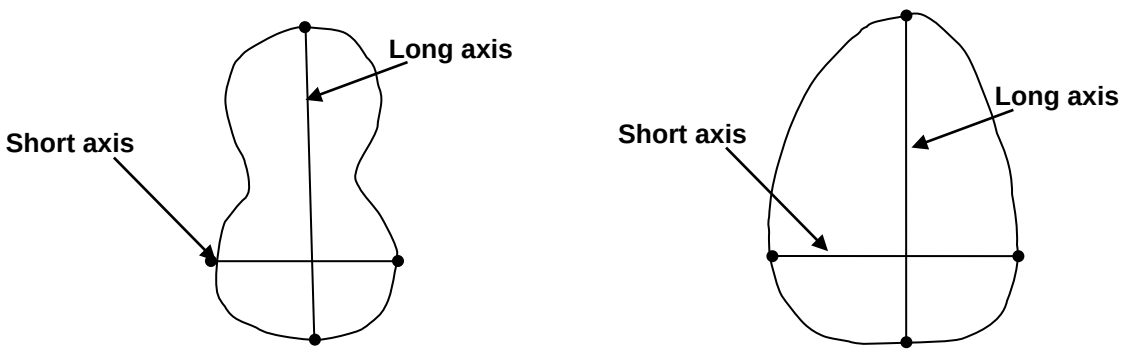


Figure 16. Examples of where to measure canopy widths.

LIVE CANOPY COVER can be based on an ocular estimate when the condition in question is certain to contain greater than 10% LIVE PLUS MISSING CANOPY COVER or CURRENT AFFORESTATION CODE = 1 and TOTAL STEMS greater than or equal to 150. For LIVE CANOPY COVER <1 percent (trace), record 01.

Values: 00 – 99 (where 99 = 99-100%)

2.5.32 LIVE PLUS MISSING CANOPY COVER

Record the percentage of LIVE PLUS MISSING CANOPY COVER for the condition by adding the LIVE CANOPY COVER plus the estimated missing canopy cover that existed prior to disturbance (harvesting, fire, etc). Include 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. Base the estimate on field observations, aerial photos, historical aerial imagery, and similar evidence of undisturbed conditions. The total of the LIVE PLUS MISSING CANOPY COVER cannot exceed 100%.

Values: 00 – 99 (where 99 = 99-100%)

2.5.33 CURRENT AFFORESTATION CODE

Record the code identifying a condition that has no evidence of prior forest, but does have evidence suggesting deliberate afforestation attempts (planted or prepared to promote tree establishment) to convert to forest in the current inventory cycle or since the last measurement.

Values:

Value	Description
0	No
1	Yes

2.5.34 PREVIOUS AFFORESTATION CODE

Record the code identifying a condition that has no evidence of prior forest, but does have evidence suggesting deliberate afforestation attempts (planted or prepared to promote tree establishment) to convert to forest the prior inventory cycle or prior to the last measurement.

Values:

Value	Description
0	No
1	Yes

2.5.35 TOTAL STEMS

Record the estimated number of live stems per acre of the condition. Base the estimate on actual stem count of tally tree species within the sample area. When using the subplot method, use the appropriate expansion factor according to tree and subplot size to obtain an estimate of the number of live stems per acre. Using microplots (i.e., the subplot method) to estimate stems <5.0 inches diameter in conditions with wide spacing or ‘clumping’ is discouraged.

Values: 00000 – 99999

2.5.36 CHAINING CODE

Record the code identifying if a condition has been chained, shear bladed, roller chopped, etc., for the purpose of increased forage production. These treatments contrast with silvicultural removals in that little or none of the woody material is removed from the site and there are few residual live trees.

Values:

Value	Description
0	No
1	Yes

2.6 Optional Fuels Variables for DWM Protocol

2.6.1 CONDITION FUELBED TYPE (OPTIONAL)

Record the fuelbed code from the Scott and Burgan (2005; RMRS-GTR-153) fuel model guide that best corresponds with the combined fire behavior characteristics of live and dead materials on and near the ground surface. The visual appearance of the condition on the plot is not as important as the amount and packing density of live and dead fuels of different sizes. Refer to fuelbed descriptions, keys, and photos in Scott and Burgan (2005) to select the fuel model which best matches conditions on the condition class. This is a CORE-OPTIONAL field.

Values:

Value	Description
GR1	Short, Sparse Dry Climate Grass
GR2	Low Load, Dry Climate Grass
GR3	Low Load, Very Coarse, Humid Climate Grass
GR4	Moderate Load, Dry Climate Grass
GR5	Low Load, Humid Climate Grass
GR6	Moderate Load, Humid Climate Grass
GR7	High Load, Dry Climate Grass
GR8	High Load, Very Coarse, Humid Climate Grass
GR9	Very High Load, Humid Climate Grass
GS1	Low Load, Dry Climate Grass-Shrub
GS2	Moderate Load, Dry Climate Grass-Shrub
GS3	Moderate Load, Humid Climate Grass-Shrub
GS4	High Load, Humid Climate Grass-Shrub
SB1	Slash-Blowdown: Low Load Activity Fuel
SB2	Moderate Load Activity Fuel or Low Load Blowdown
SB3	High Load Activity Fuel or Moderate Load Blowdown
SB4	High Load Blowdown
SH1	Low Load Dry Climate Shrub
SH2	Moderate Load Dry Climate Shrub
SH3	Moderate Load, Humid Climate Shrub
SH4	Low Load, Humid Climate Timber-Shrub
SH5	High Load, Dry Climate Shrub
SH6	Low Load, Humid Climate Shrub
SH7	Very High Load, Dry Climate Shrub
SH8	High Load, Humid Climate Shrub
SH9	Very High Load, Humid Climate Shrub
TL1	Low Load Compact Conifer Litter
TL2	Low Load Broadleaf Litter
TL3	Moderate Load Conifer Litter
TL4	Small downed logs
TL5	High Load Conifer Litter
TL6	Moderate Load Broadleaf Litter
TL7	Large Downed Logs
TL8	Long-Needle Litter
TL9	Very High Load Broadleaf Litter
TU1	Low Load Dry Climate Timber-Grass-Shrub
TU2	Moderate Load, Humid Climate Timber-Shrub
TU3	Moderate Load, Humid Climate Timber-Grass-Shrub
TU4	Dwarf Conifer With Understory

Value	Description
TU5	Very High Load, Dry Climate Timber-Shrub
NB1	Nonburnable Urban/developed
NB2	Nonburnable Snow/ice
NB3	Nonburnable Agricultural
NB8	Nonburnable Open water
NB9	Nonburnable Bare ground

3.0 SUBPLOT INFORMATION

Each subplot is described by a series of area parameters relating to topographic features and existing cover type. These data also relate to the microplot, since the microplot is contained within the subplot perimeter.

3.1 SUBPLOT NUMBER

Record the code corresponding to the number of the subplot.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

3.2 SUBPLOT/MACROPLOT STATUS

Indicate whether or not this subplot currently has at least one accessible forest land condition class. In regions measuring the CORE OPTIONAL macroplot, indicate whether or not this macroplot currently has at least one forested condition class. In situations where a subplot/macroplot is denied access or hazardous, but obviously contains no forest land, record SUBPLOT/MACROPLOT STATUS = 2. In cases where a subplot/macroplot is access-denied or hazardous land use and has the possibility of forest, record SUBPLOT/MACROPLOT STATUS = 3.

Values:

Value	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 – possibility of forest land
4	Sampled – QA crew did not measure trees, saplings, or seedlings. QA crew did measure all other data items (condition, boundary, and subplot-level data). For use only on check plots (QA STATUS = 2 - 6). Not a legal entry on production plots (QA STATUS = 1 or 7).

3.3 SUBPLOT NONSAMPLED REASON

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

Values:

Value	Description
01	Outside U.S. boundary – Assign this code to condition classes beyond the U.S. border.
02	Denied access area – Any area within the sampled area of a plot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. There are no minimum area or width requirements for a condition class delineated by denied access. Because a denied-access condition can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.

Value	Description
03	Hazardous situation – Any area within the sampled area on plot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present. There are no minimum size or width requirements for a condition class delineated by a hazardous condition
04	Time limitation – This code applies to full subplots that cannot be sampled due to a time restriction. This code is reserved for areas with limited access, and in situations where it is imperative for the crew to leave before the plot can be completed (e.g., scheduled helicopter rendezvous). Use of this code requires notification to the field supervisor. This code should not be used for an entire plot (use code 8 [skipped visit] when an entire plot is skipped; see Section 1.5).
05	Lost data – The plot data file was discovered to be corrupt after a panel was completed and submitted for processing. This code is assigned to entire plots or full subplots that could not be processed, and is applied at the time of processing after notification to the region. Note: This code is for office use only.
06	Lost plot – Entire plot cannot be found. Used for the four subplots that are required for this plot. Used only in conjunction with PLOT NONSAMPLED REASON code 06. Can be either generated by the data recorder or in the office.
07	Wrong location – Previous plot can be found, but its placement is beyond the tolerance limits for plot location. Used for the four subplots that are required for this plot. Used only in conjunction with PLOT NONSAMPLED REASON code 07. Can be either generated by the data recorder or in the office.
08	Skipped visit – Entire plot skipped. Used for the four subplots that are required for this plot. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 08. This code is for office use only.
09	Dropped intensified plot – Used for the four subplots that are required for this plot. Used only by units engaged in intensification. Applied at the time of processing and used only in conjunction with PLOT NONSAMPLED REASON code 09. This code is for office use only.
10	Other – This code is used whenever a plot or condition class is not sampled due to a reason other than one of the specific reasons already listed. A field note is required to describe the situation.
11	Ocean – Subplot falls in ocean water below mean high tide line.

3.4 NONFOREST SUBPLOT/MACROPLOT STATUS

Record the code that describes the sampling status of the other-than-forest subplot, i.e., SUBPLOT/MACROPLOT STATUS = 2. In cases where subplot is denied access or hazardous, but obviously contains no nonforest land, i.e., subplot is either noncensus water or census water, record NONFOREST SUBPLOT/MACROPLOT STATUS = 2.

Values:

Value	Description
1	Sampled – at least one accessible nonforest land condition present on the subplot.
2	Sampled – no nonforest land condition present on subplot, i.e., subplot is either census and/or noncensus water.
3	Nonsampled nonforest

3.5 NONFOREST SUBPLOT/MACROPLOT NONSAMPLED REASON

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

Values:

Value	Description
02	Denied access – A subplot/macroplot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. Because a denied-access subplot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
03	Hazardous situation – A subplot/macroplot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present.
04	Time limitation – This code applies to a full subplot/macroplot that cannot be sampled due to a time restriction. This code is reserved for areas with limited access, and in situations where it is imperative for the crew to leave before the plot can be completed (e.g., scheduled helicopter rendezvous). Use of this code requires notification to the field supervisor.
10	Other – This code is used whenever a subplot/macroplot is not sampled due to a reason other than one of the specific reasons already listed. A field note is required to describe the situation.

3.6 SUBPLOT CENTER CONDITION

Record the CONDITION CLASS NUMBER of the condition class at the subplot center.

Values: 1 to 9

3.7 MICROPLOT CENTER CONDITION

Record the CONDITION CLASS NUMBER of the condition class at the microplot center.

Values: 1 to 9

3.8 SUBPLOT SLOPE

Record the angle of slope across the subplot to the nearest 1 percent. SUBPLOT SLOPE is determined by sighting the clinometer along a line parallel to the average incline (or decline) of each subplot. This angle is measured along the shortest pathway down slope before the drainage direction changes. To measure SUBPLOT SLOPE, Observer 1 should stand at the uphill edge of the subplot and sight Observer 2, who stands at the downhill edge of the subplot. Sight Observer 2 at the same height as the eye-level of Observer 1. Read the slope directly from the percent scale of the clinometer:

- If slope changes gradually across the subplot, record an average slope.

- If slope changes across the subplot but the slope is predominantly of one direction, code the predominant slope percentage rather than the average.
- If the subplot falls directly on or straddles a canyon bottom or narrow ridge top, code the average slope of the side hill(s).
- If the subplot falls on a canyon bottom or on a narrow ridge top, but most of the area lies on one side hill, code the slope of the side hill where most of the area lies.

Values: 000 to 155

3.9 SUBPLOT ASPECT

Record the aspect across the subplot, to the nearest 1 degree. SUBPLOT ASPECT is determined along the direction of slope for land surfaces with at least 5 percent slope in a generally uniform direction. SUBPLOT ASPECT is measured with a hand compass along the same direction used to determine slope.

- If aspect changes gradually across the subplot, record an average aspect.
- If aspect changes across the subplot but the aspect is predominately of one direction, code the predominate direction rather than the average.
- If the subplot falls on or straddles a canyon bottom or narrow ridge top, code the aspect of the ridge line or canyon bottom.
- If the subplot falls on a canyon bottom or on a narrow ridge top, but most of the area lies on one side hill, code the aspect of the side hill.

Values:

Value	Description
000	No aspect, slope < 5 percent
001	1 degree
002	2 degrees
.	.
.	.
360	360 degrees, due north

3.10 SNOW/WATER DEPTH

Record to the nearest 0.1 foot the average approximate depth of water or snow covering the subplot at the time of data collection. This variable is used to indicate subplots where some variables (e.g., seedling count, total lengths) may be measured with less certainty due to conditions at the time of measurement.

Values: 0.0 to 9.9

3.11 SUBPLOT/MACROPLOT CONDITION LIST

This is a listing of all condition classes located within the 24.0-foot radius around the subplot center. In regions measuring the CORE OPTIONAL macroplot, this is a listing of all condition classes located within the 58.9-foot radius around the macroplot center. A maximum of four conditions is permitted at any individual subplot / macroplot. If a condition class has already been defined at a previously completed subplot / macroplot, use the same condition class number whenever that condition is encountered. Define new condition classes as they are encountered. If more than one condition class is listed here, boundary data are required. If only one condition class is listed, this condition is automatically assigned to the subplot center and microplot center. If less than four condition classes occur on this subplot, complete the remainder of this field with zeros. For example, if condition 1 is the only condition class on a subplot, record 1000.

Values: 1000 to 9876

3.12 P2 VEG SUBPLOT SAMPLE STATUS

Record the code to indicate if the subplot was sampled for P2 Vegetation. A subplot may be sampled for P2 Vegetation but not have any vascular plants present. If there is **any** part of an accessible portion of the subplot where other plot measurements are made but **all** the P2 Vegetation measurements cannot be completed on the subplot (for example, deep snow or water, hazardous weather, time limitation), enter code 2 and do not record **any** P2 Vegetation measurements.

Values:

Value	Description
1	Subplot sampled for P2 Vegetation
2	Subplot not sampled for P2 Vegetation

3.13 VEGETATION NONSAMPLED REASON

Record the reason why P2 Vegetation on a subplot cannot be sampled.

Values:

Value	Description
04	Time limitation
05	Lost data (for office use only)
10	Other (for example, snow or water covering vegetation that is supposed to be sampled)

3.14 VEGETATION SUBPLOT NOTES

Use this field to record notes pertaining to the subplot, and any unusual conditions encountered.

When plant specimens are collected, use this field to record a community type description for each subplot sampled for P2 Vegetation. The community description is intended to fully automate the specimen collection process by providing a description of the community in which this plant was found. Some examples of community descriptions are as follows:

- 25 year aspen boundary of mature trees. very little slope. a lot of light entry
- *acer saccharum* floodplain forest. hummock-hollow microtopography.
- mature mesic hemlock-hardwood forest adjacent to pond

The community type description field is a note that is accessible via Ctrl+E from the P2 Subplot screen for P2VEG.

Values: English language words, phrases, and numbers

3.15 INVASIVE PLANT SUBPLOT SAMPLE STATUS (Subplot-level variable)

Record the code to indicate whether the subplot was sampled for invasive plants. A subplot may be sampled but not have any invasive plants present. If there is any part of an accessible portion of the subplot where other plot measurements are made but invasive plants cannot be assessed (e.g., because of snow, water, hazardous weather, time limitation), enter code 3 and do not record any invasive plant measurements.

Values:

Value	Description
1	Subplot sampled, invasive plants present
2	Subplot sampled, no invasive plants present
3	Subplot not sampled for invasive plants

3.16 INVASIVE PLANT NONSAMPLED REASON (Subplot-level variable)

Record the reason why a subplot cannot be sampled for invasive plants.

Values:

Value	Description
4	Time limitation
5	Lost data (office use only)
10	Other (for example, snow or water covering vegetation that is supposed to be sampled)

3.17 INVASIVE PLANT DATA NOTES

Use this field to record any notes about the condition on the subplot, particularly any unusual conditions encountered.

Values: English language words, phrases, and numbers

3.18 UNLISTED TREE PRESENT

The FIA species list is the result of consultations among arborists, foresters, and forest specialists around the Nation. Although it is a comprehensive list that will account for the majority of tree form species that crews may encounter in the field, it is still possible for crews to encounter a species that was unintentionally OR intentionally excluded from the list due to growth form that, due to local environmental conditions, is now presenting in a tree growth form. The purpose of this variable is to provide information on such species in an attempt to further refine the species list in future inventories.

An UNLISTED TREE is defined as a live tree that is at least 5.0 inches DBH / DRC located within a subplot that is not on the Master Species List OR is on the list but is found within an exclusion zone where it is not a legal tally tree. Record the presence of any UNLISTED TREEs found on the subplots.

Values:

Value	Description
0	No unlisted trees present
1	Unlisted tree present

3.19 UNLISTED TREE GENUS

Record the genus for each UNLISTED TREE species encountered on the subplot.

Values: English language letters

3.20 UNLISTED TREE SPECIES

Record the species of each UNLISTED TREE GENUS recorded.

Values: English language letters

3.21 UNLISTED TREE SPECIES COUNT

Record the number of instances each UNLISTED TREE SPECIES is encountered on the plot. Estimate counts over 10 individuals.

Values: 1 to 99

3.22 UNLISTED TREE SPECIMEN COLLECTED (CORE OPTIONAL. Collected in NRS, RMRS)

Record a code to indicate whether or not a specimen was collected for each UNLISTED TREE SPECIES. If a specimen is not collected, describe the reason it is not collected in UNLISTED TREE NOTES.

Values:

Value	Description
0	No, a specimen was not officially collected
1	Yes, a specimen was officially collected

3.23 SPECIMEN LABEL NUMBER (CORE OPTIONAL. Collected in NRS, RMRS)

Record the label number for the collected specimen.

Values: 1 to 99999, as pre-assigned by FIA unit

3.24 UNLISTED TREE NOTES

Notes are required for each UNLISTED TREE SPECIES record. Enter text that describes the species or that explains why it was not collected if collection was required but not done. This text may be used on the specimen label and any spreadsheet used to track specimens. Use the notes section to provide any information about sources used to identify the species of the UNLISTED TREE.

PDR Note: Record this note while in the UNLISTED TREE SPECIES record. Press the “Ctrl”+“N”.

Listed are some examples of why a specimen may not be collected:

- Species has less than 1% canopy cover on the subplot and no mature foliage or reproductive parts are present.
- Hazardous situation.
- Time limitation.
- Other (explain in notes).

Values: English language words, phrases, and numbers

4.0 BOUNDARY REFERENCES

Boundary reference data are used to compute the area for the condition classes sampled on a plot and to remeasure plots. Record all boundaries between condition classes that occur within the sampled (fixed-radius) area on subplots and microplots (and optionally macroplots). Boundaries outside sampled (fixed-radius) areas are not referenced.

In addition to using the recording procedures described herein, sketch maps of condition class boundaries onto the pre-printed plot diagrams on paper field tally sheets.

4.1 Reference Procedure

Within the sampled area on each microplot, subplot, and macroplot, reference the approximate boundary of each condition class that differs from the condition classes at a subplot center. Trees selected on these fixed-radius plots are assigned to the actual condition in which they lie regardless of the recorded approximate boundary delineated.

Boundary referencing is done by recording azimuths and distances from subplot center to the reference points and/or from microplot center to the reference points (figs. 17 and 18). Each boundary is marked by a maximum of three points - two where the boundary intersects the subplot circumference or microplot circumference, and one "corner" point between the two end points, if necessary. Only the corner point requires a distance, since the distance from the center to the circumference is always equal to the fixed plot radius.

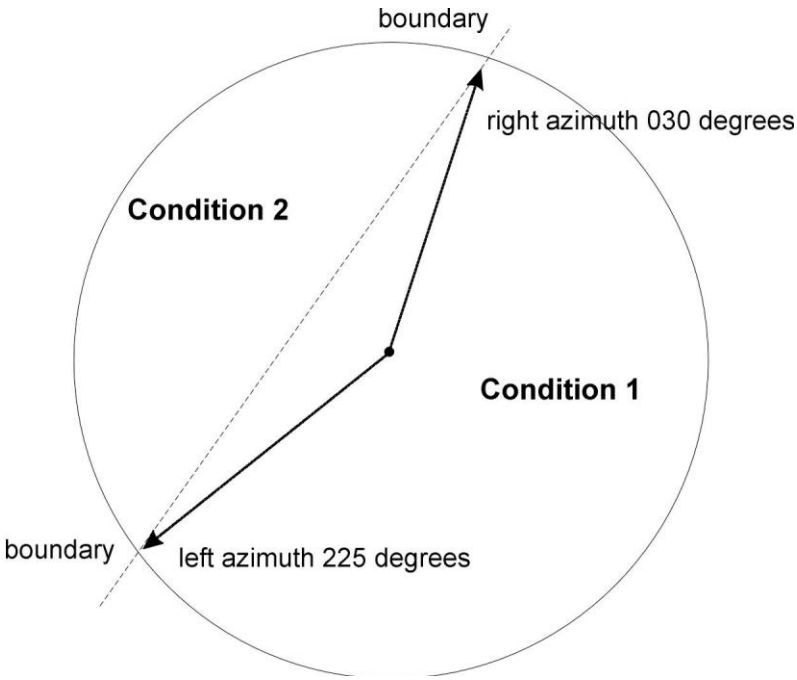


Figure 17. How to measure a straight boundary on a microplot, subplot, or macroplot.

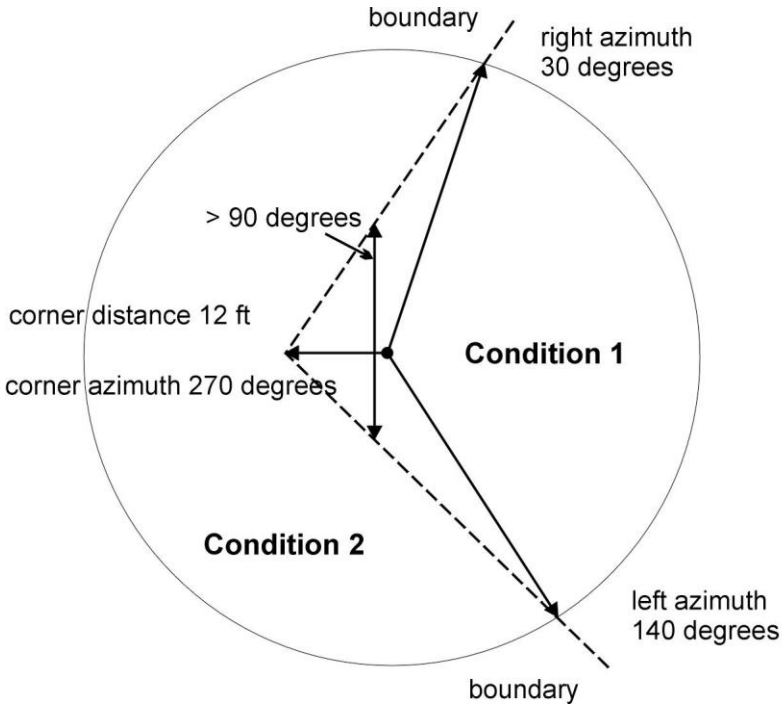


Figure 18. How to measure a boundary with a corner on a subplot or macroplot.

Microplot boundaries are referenced to the microplot center, and macroplot boundaries are referenced to the subplot center in the same manner described for subplots. Note that the larger the plot, the greater likelihood of a need for a boundary corner to record boundaries that are not straight lines.

Refer to Sections 2.1 and 2.4 for general condition class delineation guidelines. The following additional rules apply when referencing a boundary within a subplot, microplot, or macroplot:

1. When a boundary between accessible forest land and nonforest land or between two contrasting accessible forest land condition classes is clearly marked, use that feature to define the boundary. Examples of clear demarcation are a fence line, plowed field edge, sharp ridge line, and water's edge along a stream course, ditch, or canal.

2. When a boundary between forest land and nonforest land is not clearly marked by an obvious feature, the boundary should follow the nonforest side of the stems of the trees at the forest edge.

3. When a boundary between two contrasting forest land condition classes is not clearly marked, map along the stems of the contrasting condition. When the boundary between two contrasting forest land condition classes is separated by a narrow linear inclusion (creek, fire line, narrow meadow, unimproved road), establish the boundary at the far edge of the inclusion relative to subplot center.

4. When a plot is remeasured, the crew will examine the boundaries referenced at last inventory. If no change has occurred, the current crew will retain the boundary data that were recorded at last inventory. If a boundary has changed, or a new boundary is

present, or the previous crew made an obvious error, record new or updated boundary data. Delete boundaries that are no longer distinct.

5. Although individual tolerances are specified for the azimuths and distances, in practice a crew will be considered ‘correct’ when the difference in areas as mapped by the original crew and by the QA crew is less than 10 percent of the subplot or microplot area. This allows for slight variations in azimuths or distances due to the approximate nature of mapping procedures.

4.2 Boundary Data

Record the appropriate values for each boundary mapped on the subplot, microplot, or macroplot as follows:

4.2.1 SUBPLOT NUMBER

Record the code corresponding to the number of the subplot.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

4.2.2 PLOT TYPE

Record the code to specify whether the boundary data are for a subplot, microplot, or macroplot.

Values:

Value	Description
1	Subplot boundary
2	Microplot boundary
3	Macroplot boundary (coded only when macroplots are taken)
4	Hectare plot boundary (coded from subplot 1 only)

4.2.3 BOUNDARY CHANGE

Remeasurement (SAMPLE KIND = 2) locations only. Record the appropriate code to indicate the relationship between previously recorded and current boundary information.

Values:

Value	Description
0	No change - boundary is the same as indicated on plot map and/or data collected by a previous crew.
1	New boundary, or boundary data has been changed to reflect an actual on-the-ground physical change resulting in a difference from the boundaries recorded.
2	Boundary has been changed to correct an error from previous crew.
3	Boundary has been changed to reflect a change in variable definition.

4.2.4 CONTRASTING CONDITION

Record the CONDITION CLASS NUMBER of the condition class that contrasts with the condition class located at the subplot center (for boundaries on the subplot or macroplot) or at the microplot center (for boundaries on the microplot), e.g., the condition class present on the other side of the boundary line. See section 3.0 for subplot data.

Values: 1 to 9

4.2.5 LEFT AZIMUTH

Record the azimuth from the subplot, microplot, or macroplot center to the farthest left point (facing the contrasting condition) where the boundary intersects the subplot, microplot, or macroplot circumference.

Values: 001 to 360

4.2.6 CORNER AZIMUTH

Record the azimuth from the subplot, microplot, or macroplot center to a corner or curve in a boundary. If a boundary is best described by a straight line between the two circumference points, then record 000 for CORNER AZIMUTH (000=none).

Values: 000 to 360

4.2.7 CORNER DISTANCE

Record the horizontal distance, to the nearest 1 foot, from the subplot, microplot, or macroplot center to a boundary corner point.

Values:

Value	Description
microplot	001 to 007 ft (actual limiting distance is 6.8 ft)
subplot	001 to 024 ft
macroplot	001 to 059 ft (actual limiting distance is 58.9 ft)
hectare	001 to 185 ft

4.2.8 RIGHT AZIMUTH

Record the azimuth from subplot, microplot, or macroplot center to the farthest right point (facing the contrasting condition) where the boundary intersects the subplot, microplot, or macroplot circumference.

Values: 001 to 360

5.0 TREE AND SAPLING DATA

Trees at least 5.0 inches in diameter are sampled within the subplot. 'Tally trees' are defined as all live and standing dead trees in accessible forest land condition classes encountered on the subplot the first time a subplot is established, and all trees that grow into a subplot thereafter. These data yield information on tree volume, growth, mortality, and removals; wildlife habitats; forest structure and composition; biomass; and carbon sequestration.

Trees with a diameter at least 1.0 inch but less than 5.0 inches, termed saplings, are sampled within the microplot. 'Tally saplings' are defined as all live and standing dead saplings in accessible forest land condition classes encountered the first time a microplot is established, and all saplings that grow into each microplot thereafter are included until they grow to 5.0 inches or larger, at which time they are tallied on the subplot and referenced (new AZIMUTH and HORIZONTAL DISTANCE taken) to the subplot center.

For multi-stemmed woodland species, a cumulative DRC is used to compute diameter as described in Sections 5.9 and 5.9.4.

Trees are alive if they have any living parts (leaves, buds, cambium) at or above the point of diameter measurement, either diameter at breast height (DBH) or diameter at root collar (DRC). Trees that have been temporarily defoliated are still alive.

Once tallied, dead trees 1.0 inch and greater in diameter are tracked until they no longer qualify as standing dead. **Working around dead trees is a safety hazard - crews should exercise extreme caution! Trees that are deemed unsafe to measure should be estimated.**

To qualify as a standing dead tally tree, dead trees must be at least 1.0 inch in diameter, have a bole which has an unbroken ACTUAL LENGTH of at least 4.5 feet, and lean less than 45 degrees from vertical as measured from the base of the tree to 4.5 feet.

The portion of a bole on dead trees that are separated greater than 50 percent (either above or below 4.5 feet), are considered severed and may qualify as Down Woody Material (DWM). See DWM procedures for tally criteria.

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

Live and dead standing tally trees, and partially separated boles of dead tally trees, do not have to be self-supported. They may be supported by other trees, branches, or their crown.

Trees that have been cut above DBH qualify as tally trees, provided they meet the size requirement.

The following apply at remeasurement:

- If at the previous visit a forked tree was recorded as two separate trees but should have been recorded as one tree, reconcile one tree and correct the diameter for the remaining tree. Give one of the tree data lines a PRESENT TREE STATUS = 0, RECONCILE = 7, and a TREE NOTE. The remaining tree data line receives PRESENT TREE STATUS = 1 or 2 with DIAMETER CHECK = 2, and a TREE NOTE.
- If at the previous visit, a forked tree was recorded as one tree but should have been recorded as two separate trees, correct the diameter for the remeasured tree to

represent one tree, and add the other fork as a missed tree. Use the existing tree data line to represent one of the stems. PRESENT TREE STATUS = 1 or 2, DIAMETER CHECK = 2, and a TREE NOTE. The second stem would get PRESENT TREE STATUS = 1 or 2, RECONCILE 7 or 8, and a TREE NOTE.

Begin tallying trees at an azimuth of 001 degrees from subplot center and continue clockwise around the subplot. Repeat this sequence for trees on the microplot and again on the annular plot.

5.1 SUBPLOT NUMBER

Record the subplot number where the tree occurs.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

5.2 TREE RECORD NUMBER

Record a code to uniquely and permanently identify each tree on a given subplot. The TREE RECORD NUMBERs must be unique within a subplot – being unique is more important than being sequential. In general, work clockwise from azimuth 001 to 360, and work outwards from subplot center to subplot perimeter. On remeasured plots, use the previously assigned tree number. Saplings tallied on microplots will retain their initially assigned tree number if they grow to tree size. Missed trees and ingrowth trees (trees that either grew over the 1.0-inch threshold on the microplot or grew onto the subplot) will be assigned the next available tree number. DO NOT renumber all plot trees in order to assign a more “correct” tree number to a missed tree. Numbers assigned to trees that are subsequently found to be extra will be dropped and not reused.

If TREE RECORD NUMBERs are not assigned in the field, record 000.

Note: If this is a Phase 3 plot, match the trees on this point to the hard copy list provided. Record the three-digit FHM tree number assigned to each standing tree.

Values: 000 or 001 to 999

5.3 CONDITION CLASS NUMBER

Record the CONDITION CLASS NUMBER in which each tree is located. Often, a referenced boundary is approximate, and trees selected for tally are assigned to the actual condition in which they lie regardless of the recorded approximate boundary (fig. 19).

Values: 1 to 9

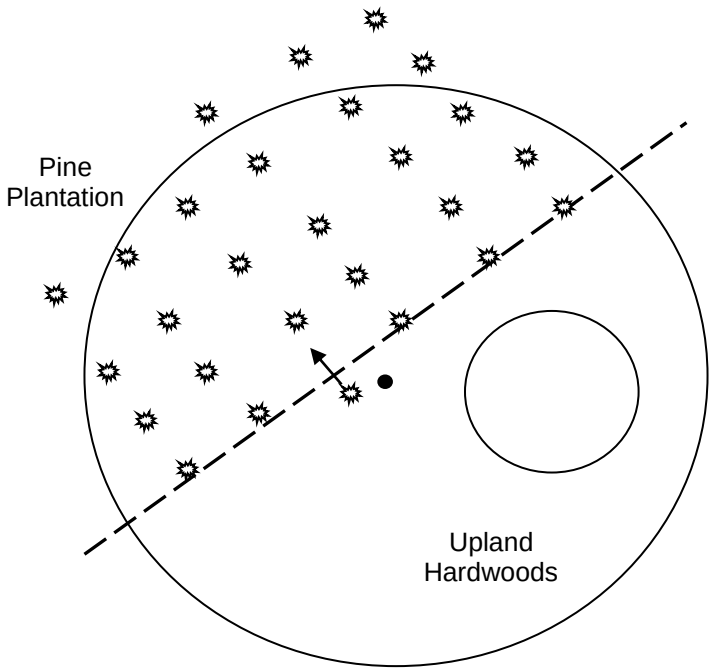


Figure 19. Ragged CONDITION CLASS boundary and tree condition class designation.

5.4 AZIMUTH

Record the AZIMUTH from the subplot center (for trees greater than or equal to 5.0 inches DBH/DRC) or the microplot center (for trees greater than or equal to 1.0 inch and less than 5.0 inches DBH/DRC), sight the center of the base of each tree with a compass. Sight to the geographic center for multi-stemmed woodland species (Appendix 3). The geographic center is a point of equal distance between all tallied stems for a given woodland tree. Record AZIMUTH to the nearest degree. Use 360 for north.

Values: 001 to 360

5.5 HORIZONTAL DISTANCE

Record the measured HORIZONTAL DISTANCE, to the nearest 0.1 foot, from the subplot center (for trees greater than or equal to 5.0 inches DBH/DRC) or microplot center (for trees greater than or equal to 1.0 inch and less than 5.0 inches DBH/DRC) to the pith of the tree at the base. For all multi-stemmed woodland trees (woodland species indicated in Appendix 3), the HORIZONTAL DISTANCE is measured from subplot or microplot center to the "geographic center" of the tree. The geographic center is a point of equal distance between all tallied stems for a given woodland tree.

Note: On remeasurement plots (SAMPLE KIND = 2), the current crew is responsible for verifying downloaded data and updating when it is out of tolerance. When the old pin or dowel is not found, current cruisers should consider all “edge” trees or saplings that were in or out on the previous occasion when reestablishing the subplot center. For saplings on the microplot that become trees at the time of plot remeasurement, crews must collect new HORIZONTAL DISTANCE information from the subplot center.

Values:

Value	Description
Microplot	00.1 to 06.8
Subplot	00.1 to 24.0
Annular plot	24.1 to 58.9

5.6 PREVIOUS TREE STATUS

If not downloaded from the previous inventory, record PREVIOUS TREE STATUS for each remeasured tally tree, including ALL new standing dead trees (PRESENT TREE STATUS = 2, STANDING DEAD CODE = 1, RECONCILE >0). This code is used to track the status of sample trees over time. This information is needed to correctly assign the tree to the proper component of change.

Values:

Value	Description
1	Live Tree – alive at the previous inventory
2	Dead tree – standing dead tree at the previous inventory

5.7 PRESENT TREE STATUS

Record a current PRESENT TREE STATUS for each tallied tree. This code is used to track the status of sample trees over time: as they first appear, as ingrowth, as they survive, and when they die or are removed. This information is needed to correctly assign the tree to the proper component of change.

Values:

Value	Description
0	No status – tree is not presently in the sample (remeasurement plots only). Tree was incorrectly tallied at the previous inventory, currently is not tallied due to definition or procedural change, or is not tallied because it is located on a Nonsampled Condition (i.e., hazardous or denied). Requires RECONCILE code = 5-9.
1	Live tree – any live tree (new, remeasured or ingrowth)
2	Dead tree – any dead tree (new, remeasured, or ingrowth), regardless of cause of death. Includes all previously standing dead trees that no longer qualify as standing dead, trees killed by silvicultural or land clearing activity and assumed not to have been utilized, as well as dead trees that may have been present at the time of plot establishment but only tallied now due to procedural change
3	Removed – a tree that has been cut and removed by direct human activity related to harvesting, silviculture or land clearing (remeasurement plots only). The tree is assumed to have been utilized.

Note: On remeasured plots, crews must collect new AZIMUTH and HORIZONTAL DISTANCE information from the subplot center for microplot saplings that grow to become subplot trees. For live or standing dead subplot trees that shrink to become live or dead saplings on the microplot, crews must collect new AZIMUTH and HORIZONTAL DISTANCE information from the microplot center.

5.7.1 RECONCILE

For remeasurement locations only, record a RECONCILE code for any new tally tree that was not tallied in the previous inventory, and for all no status remeasurement trees (PRESENT TREE

STATUS = 0). This code is used to identify the reason a new tree appeared in the inventory, and identify the reason a remeasurement tree no longer qualifies as a tally tree. This information is needed to correctly assign information to the proper component of change.

Values:

Codes 1-2 are only valid for new trees (PRESENT TREE STATUS = 1 or 2) on the plot and exclude trees associated with a change in procedures / definitions or previous cruiser error, as such trees are accounted for with RECONCILE = 7 or 8. If a new tree is located in an area that was previously nonsampled, then use RECONCILE = 9.

Value	Description
1	Ingrowth – either (a) a new tally tree not qualifying as through growth, or (b) a new tree on land that was formerly nonforest and now qualifies as forest land unrelated to cruiser error or procedural / definition change.
2	Through growth – new tally tree 5.0 inches DBH/DRC and larger, within the microplot, which was not missed at the previous inventory (i.e., grew from seedling to at least 5.0 inches DBH between plot inventory cycles – such trees were never tallied on a microplot).

Codes 5 is only valid for remeasured trees (PRESENT TREE STATUS = 0) that no longer qualify as tally.

5	Shrank – live tree that shrank below threshold diameter on microplot / subplot / macroplot. Must currently be alive.

Codes 6-9 are valid for both new tally trees (PRESENT TREE STATUS = 1 or 2) and remeasured trees that no longer qualify as tally (PRESENT TREE STATUS = 0).

Value	Description
6	Physical movement – tree was either (a) correctly tallied in previous inventory, but has now moved beyond the radius of the plot due to natural causes (e.g., small earth movement, hurricane), or (b) outside the radius of the plot previously, but has now moved within the plot due to natural causes. Tree must be either live before and still alive now, or dead before and dead now. If tree was live before and now dead, this is a mortality tree and should have PRESENT TREE STATUS = 2 (not 0).
7	Cruiser error – tree was either (a) erroneously tallied (added tree), or (b) erroneously not tallied (missed tree) at the previous inventory.
8	Procedural change – tree either (a) was tallied at the previous inventory, but is no longer tallied due to a definition or procedural change, or (b) was not tallied at the previous inventory, but is now tallied due to a definition or procedural change.
9	Nonsampled area - tree either (a) was located in a sampled condition at the previous inventory, but now is in a nonsampled condition, or (b) the area where the tree is located was previously not sampled, but now is sampled. All trees located in a nonsampled area (either now or previously) have RECONCILE = 9.

Code 5 is used to indicate live trees that shrink below the diameter threshold on the microplot/subplot/macroplot. For example, if a live remeasurement tree shrinks below the 5.0-inch DBH/DRC, then record the following combination of codes: PREVIOUS TREE STATUS = 1, PRESENT TREE STATUS = 0, RECONCILE = 5. If a live measured tree shrinks below the 5.0-inch threshold on the subplot and is currently greater than or equal to 1.0 inch on the microplot, then record PREVIOUS TREE STATUS = 1, PRESENT TREE STATUS = 1. Record all required items for a tally sapling. Use the tree coding guide in Appendix 8 to determine the national coding method for remeasurement trees.

The following table, which is an abbreviated list from appendix 8, describes how to tally standing dead saplings with respective PRESENT TREE STATUS, RECONCILE CODE, and STANDING DEAD, which were being collected for the first time in Field Guide version 7.0:

Dead Sapling Tally – New plots	**PRESENT TREE STATUS**	**RECONCILE CODE**	**STANDING DEAD**	**CAUSE of DEATH**
Standing dead 1.0 – 4.9 DBH/DRC	2	Null	Auto-populated	Core optional

Dead Sapling Tally – Remeasure plots	**PRESENT TREE STATUS**	**RECONCILE CODE**	**STANDING DEAD**	**CAUSE of DEATH**
Previous live <1.0 and has grown to ≥1.0 and died	2	1	1	10-80
Previous live 1.0+; now standing dead 5.0+ DBH/DRC	2	Null	1	10-80
Previous ≥1 inch and <5 inches and was dead and is still standing dead	2	8	1	Null
Previous live 1+ missed; now 1+ DBH/DRC and dead	2	8	1	10-80
Previous live 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot).	2	Null	0	10-80
Previous dead 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot).	2	Null	0	Null
Previous live 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead located on the microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center.	2	Null	1	10-80
Previous dead 5.0+ DBH/DRC; now tree shrank <5.0 but ≥1.0 (e.g., bark loss) and is standing dead located on the microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center.	2	Null	1	Null

5.7.2 STANDING DEAD

Record the code that describes whether or not a tree qualifies as standing dead. To qualify as a standing dead tally tree, dead trees must be at least 1.0 inch 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. See figures 20-22 for examples.

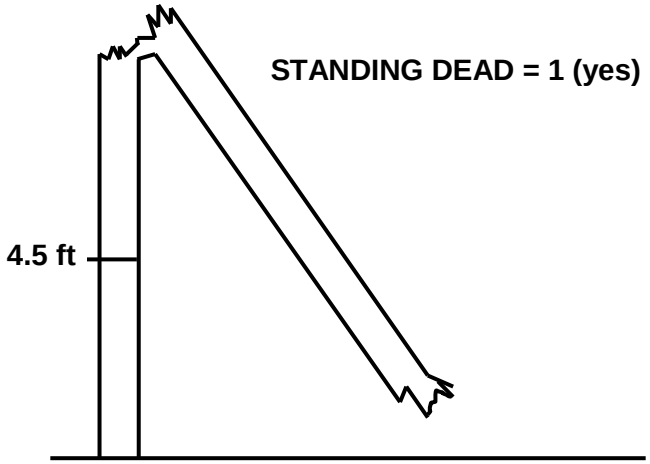
"Unbroken" is defined as at least 50 percent attached to the original source of growth
Portions of boles on dead trees that are separated greater than 50 percent (either above or below 4.5 feet), are considered severed and are included in Down Woody Material (DWM) if they otherwise meet DWM tally criteria.

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

Live and dead standing tally trees, and partially separated boles of dead tally trees, do not have to be self-supported. They may be supported by other trees, branches, or their crown.

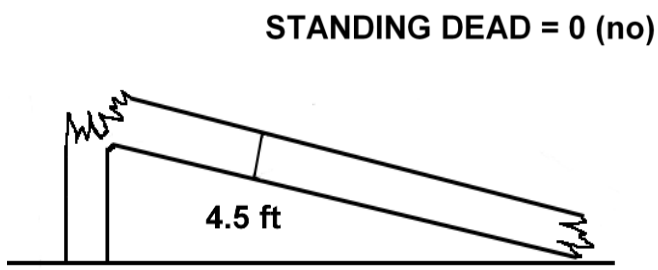
Values:

Value	Description
0	No – tree does not qualify as standing dead.
1	Yes – tree does qualify as standing dead.



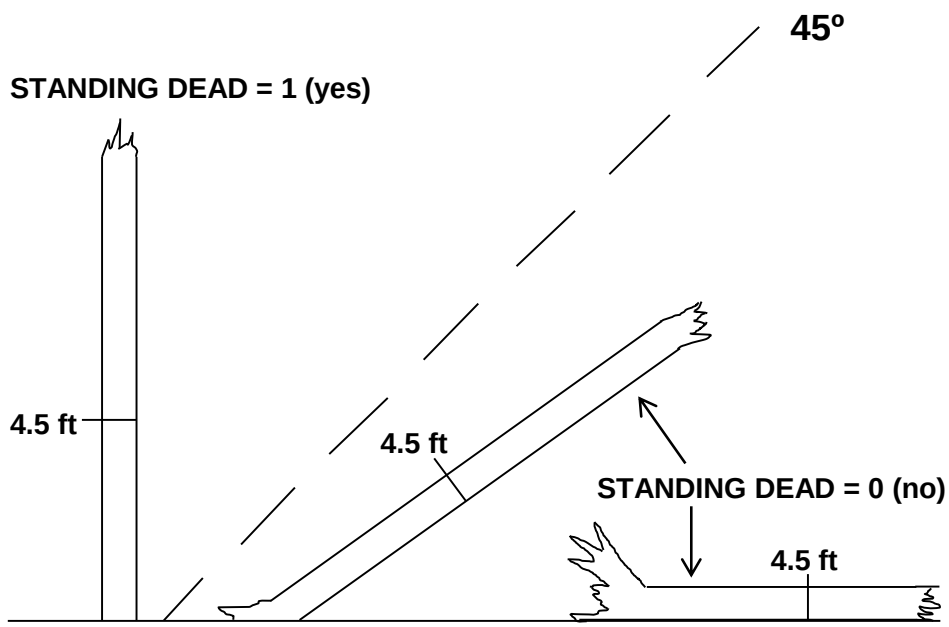
(Tree is at least 1.0 inch at 4.5 feet and is at least 4.5 feet in unbroken ACTUAL LENGTH)

Figure 20. Example of an unbroken bole to 4.5 feet.



(Tree is at least 1.0 inch at 4.5 feet, but does not have 4.5 feet in unbroken ACTUAL LENGTH)

Figure 21. Example of an unbroken length of < 4.5 feet.



(Trees are at least 1.0 inch at 4.5 feet and are at least 4.5 feet in unbroken ACTUAL LENGTH)

Figure 22. Other examples of dead trees

5.7.3 MORTALITY (CORE OPTIONAL)

Record a mortality code for any tree that was live within the past five years but has died, regardless of cause of death. This information is needed to correctly assign volume information to the proper component of volume change.

Values:

Value	Description
0	No – tree does not qualify as mortality.
1	Yes – tree does qualify as mortality.

5.8 SPECIES

Record the appropriate SPECIES code from the Master Species List (Appendix 3). If the species cannot be determined in the field, tally the tree, but bring branch samples, foliage, cones, flowers, bark, etc. to the office for further researching. If possible, collect samples outside the subplots from similar specimens and make a note to correct the SPECIES code later. Use code 0999 only as a place holder (outside the Pacific and Caribbean Islands) in the PDR for an unknown live tree while its actual species is being investigated. Use code 0299 for unknown dead conifer, 0998 for unknown dead hardwood when the genus or species codes cannot be determined. This is often the case with standing dead trees on newly established plots. The generic (genus) code should only be used when you are sure the species is on the Master Species List, but you cannot differentiate among acceptable listed species. Use of the genus code should be a last resort and is limited to valid genus codes within the geographic area that describes the tree's location while accounting for the 3 exclusion areas. If a hybrid species is found, naturally or planted, and is on the Master Species List, use the hybrid code; otherwise code the parent species with the most dominant characteristic from the list. If neither the hybrid nor either of the parent species are listed, then do not tally the species and follow the UNLISTED TREE protocol (variables 3.18 – 3.24). If a variety or subspecies is found, naturally or planted, and is listed on the Master Species List, use the corresponding variety / subspecies code. If the variety is not listed, but the species is listed, code the specimen using the species code. Species marked as woodland (W) designate species where DRC is measured instead of DBH.

The Master Species List includes all tree species tallied in the continental U.S as well as both the Caribbean and Pacific Islands, including Hawaii. These species are valid in all areas except for the following three geographic exceptions:

- Non-urban exclusion (**NUE**): These species are excluded from non-urban areas. These species are only valid tally trees on plots that are located within urban areas.

Non-urban exclusions (NUE)

Woodland	FIA Code	Common Name	Genus	Species
-	299	unknown dead conifer	Tree	conifer
w	300	acacia spp.	Acacia	spp.
-	508	oneseed hawthorn	Crataegus	monogyna
-	772	sour cherry, domesticated	Prunus	domestica
w	902	New Mexico locust	Robinia	neomexicana
-	928	Scouler's willow	Salix	scouleriana
-	998	unknown dead hardwood	Tree	broadleaf
-	5188	gray alder	Alnus	incana
-	5192	green alder	Alnus	viridis
-	5436	California redbud	Cercis	orbiculata
-	6524	Chinese fringetree	Chionanthus	retusus
-	7469	yaupon	Ilex	vomitoria
w	7577	Japanese privet	Ligustrum	japonicum
w	7578	glossy privet	Ligustrum	lucidum
w	7579	California privet	Ligustrum	ovalifolium
-	7637	Oyama	Magnolia	sieboldii
-	8112	paloverde	Parkinsonia	spp.
-	8345	Carolina laurelcherry	Prunus	caroliniana
-	8504	arroyo willow	Salix	lasiolepis

- National Forest Region exclusion (**NFS 1, 2, 3, 4, 5, 6, 8, 9, and/or 10**): These species are not valid tally trees on plots within the specified National Forest System Region. However, they are valid on plots that are located within urban areas in that NFS Region.

National Forest System (NFS) exclusions

NFS exclusions	Woodland	FIA Code	Common Name	Genus	Species
3	w	303	sweet acacia	Acacia	farnesiana
5, 6, 10	-	356	serviceberry spp.	Amelanchier	spp.
5, 6	w	475	curlleaf mountain-mahogany	Cercocarpus	ledifolius
5, 6, 10	-	500	hawthorn spp.	Crataegus	spp.
5, 6, 10	-	660	apple spp.	Malus	spp.
3, 4	-	763	chokecherry	Prunus	virginiana
3, 4	-	768	bitter cherry	Prunus	emarginata
3	-	805	canyon live oak	Quercus	chrysolepis
5, 6, 10	-	5146	vine maple	Acer	circinatum
3	-	6961	golden dewdrops	Duranta	erecta
3	-	7262	Creole cotton	Gossypium	barbadense
3	-	7264	Gossypium hirsutum	Gossypium	hirsutum
3	-	8111	Jerusalem thorn	Parkinsonia	aculeate
5, 6, 10	-	8420	pear spp.	Pyrus	spp.
3	-	8472	castorbean	Ricinus	communis

- Mainland exclusion (**MLE**): These species are limited to the Caribbean and Pacific Islands, including Hawaii.

Mainland exclusions (MLE)

Woodland	FIA Code	Common Name	Genus	Species
-	999	Other or unknown live tree	Tree	unknown
-	6862	swamp titi	Cyrilla	racemiflora

Values: See Appendix 3

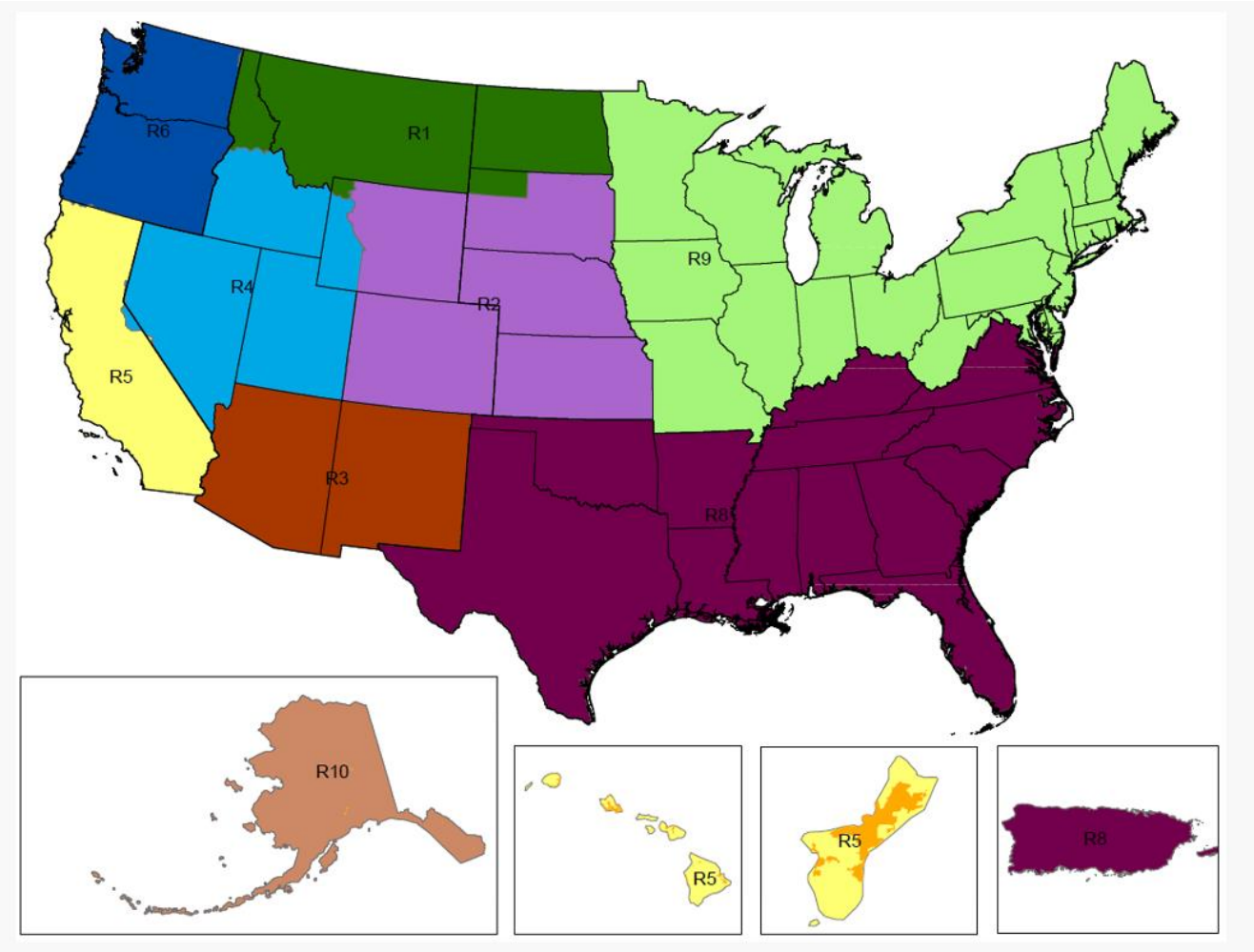


Figure 23. National Forest System (NFS) Regions.

5.9 DIAMETER

Diameters are measured at either breast height (DBH) or at the root collar (DRC). Species requiring DRC, referred to as woodland species, are denoted with a “w” in Appendix 3. Trees with diameters between 1.0- and 4.9-inches are measured on the 6.8-foot radius microplot. Those with diameters of 5.0-inches and larger are measured on the 24-foot radius subplots. Macroplot tree diameter thresholds are determined according to regional specifications (see regional field guides for more information).

In order to accurately remeasure diameter (DBH or DRC) at the same point on the tree bole at successive visits, regions have the option of measuring and recording the distance from the ground to the point of diameter measurement, or marking the point of measurement with a scribe, crayon, paint, or aluminum nail. When marking trees for the first time, measure the diameter after the mark is in place. Use caution to avoid damaging trees with scribes and nails. Do not scribe or nail trees less than 3.0-inches in diameter, or species vulnerable to introduction of pathogens (e.g., aspen). Do not penetrate the cambium when using a bark scribe.

Remeasurement trees:

When remeasuring the diameter of a tree tallied at a previous survey, always take the measurement at the location monumented by the previous crew unless it is not physically

possible (e.g., tree buried by mudslide), there is an abnormality at the previous DIAMETER measurement point, or the previous location is more than 12 inches beyond where the diameter should be measured according to current protocols (either because protocols have changed or the previous crew made a mistake). Previous diameter measurement locations should not be moved due to the loss or addition of a forked stem. Assign a DIAMETER CHECK code of 2 whenever the point of measurement is moved.

For remeasurement of a group of multiple forks (≥3) that originate from approximately the same point on the main stem at Time 1 that are now recorded as a single tree using the **Measure Low Approach (see appendix 6)** at Time 2, select one of the group to represent the resulting single tree (choose the "most representative" of the group in relation to the resulting tree) to measure at Time 2, and record a current diameter based on the **Measure Low Approach** guidelines and assign with:

- DIAMETER CHECK = 2
- LENGTH TO DIAMETER MEASUREMENT POINT

The remaining forks that were measured at Time 1 are now considered part of this single tree (branches). The tree records for these are retired with:

- PRESENT TREE STATUS = 0
- RECONCILE = 8

Values: 001.0 to 999.9

5.9.1 PREVIOUS DIAMETER AT BREAST HEIGHT

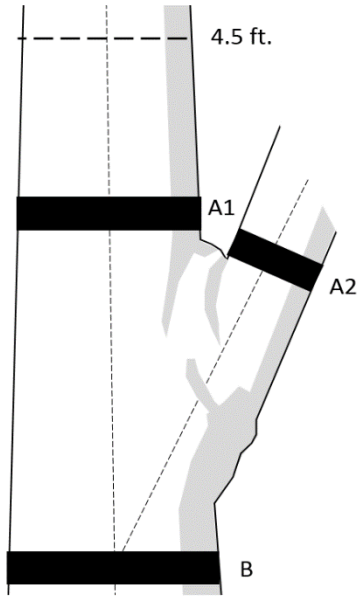
This is the DBH assigned at the previous survey. It has been downloaded from the previous inventory. Any change made to this field signifies an error at the time of the previous inventory. DIAMETER CHECK should be set to 2 and an explanation is required in the notes if previous DBH is changed.

5.9.2 DIAMETER AT BREAST HEIGHT (DBH)

Unless one of the following special situations is encountered, measure DBH at 4.5 feet above the ground line on the uphill side of the tree. Round each measurement down to the last 0.1 inch. For example, a reading of 3.68 inches is recorded as 3.6 inches.

Special DBH situations:

1. Forked tree: In order to qualify as a fork, the stem in question must be at least 1/3 the diameter of the main stem and must branch out from the main stem at an angle of 45 degrees or less (figs. 24-28), AND must be judged to have, or have the potential to assume an obvious "tree like" form and function as opposed to an obvious "branch like" form and function. If there is any doubt as to the form and function of a potential fork, call it a fork instead of a branch. Figure 29 provides examples where the form and function are considerations. Forks originate at the point on the bole where the piths intersect. Forked trees are handled differently depending on whether the fork originates below 1.0 foot, between 1.0 and 4.5 feet, or above 4.5 feet. Seedling-sized stems, (i.e., stems that are less than 1 inch in diameter at the point of attachment or at the prescribed diameter location, 3.5 feet above pith separation), are not considered forks.

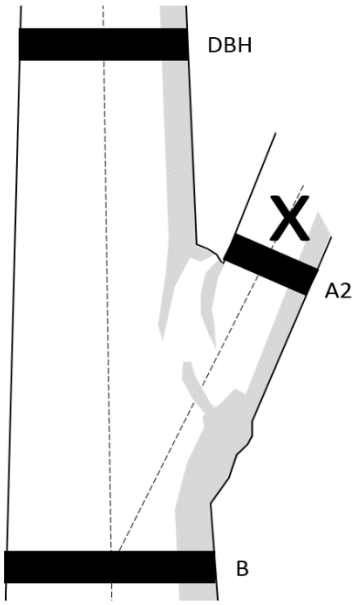


A1, A2 and B represent diameter locations for determining if minimum diameter ratios are met. Diameter ratios are met if:

$$\frac{A1}{B} \geq \frac{1}{3}$$

$$\frac{A2}{B} \geq \frac{1}{3}$$

Figure 24. Determining diameter ratio of forks. When determining if a fork meets the 1/3 diameter requirement for qualifying as a fork, the diameter of the potential fork taken at locations A1 and A2 must be 1/3 of the diameter at location B.



If one of the potential forks is less than 1/3 the diameter at B, then no fork exists and the diameter would be placed at 4.5 feet from the ground on the qualifying stem.

$$\frac{A2}{B} < \frac{1}{3}$$

Figure 25. A single non-qualifying fork. If one of the forks does not meet the minimum ratio, then no fork exists and the diameter is placed at the normal location on the dominant stem.

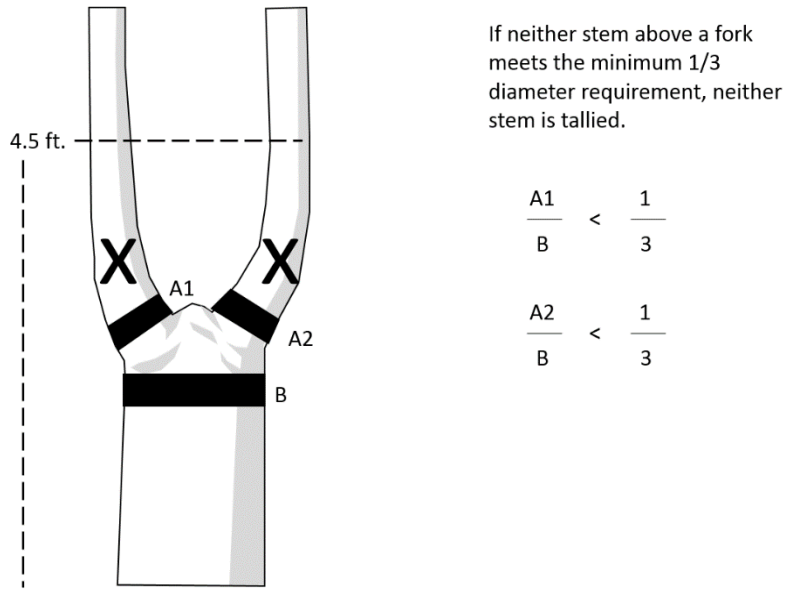


Figure 26. Two non-qualifying stems. If neither stem meets the 1/3 diameter requirement, neither is tallied. This is often associated with broken tops and is consistent with the point at which a stem is considered recovered from a break.

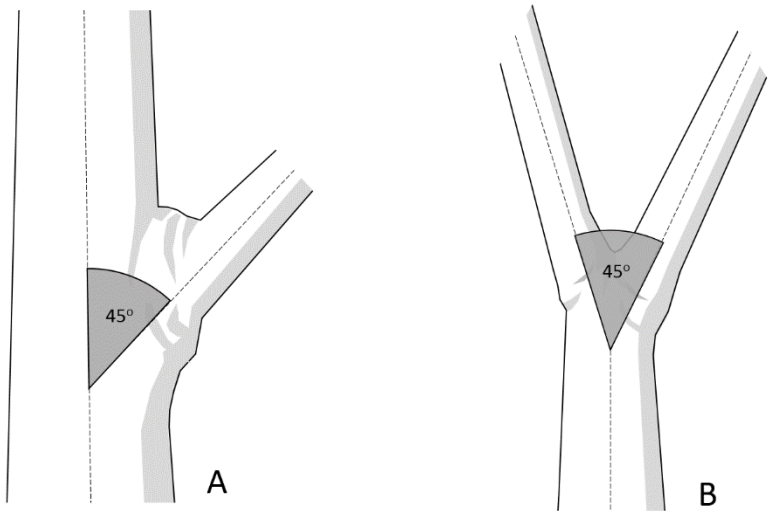


Figure 27. Forking angle. In order to qualify as a fork, the piths must diverge at an angle not exceeding 45 degrees from the main stem (A). In cases where there is no obvious main stem (B), consider the angle of pith separation between the two stems.

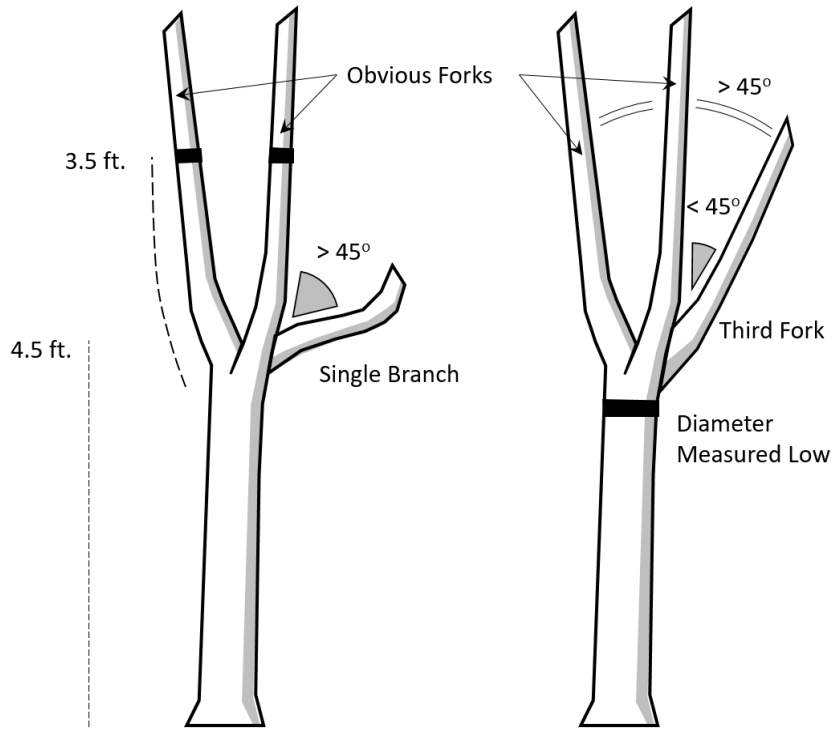


Figure 28. The tree on the left has two stems that are clearly forks and a single branch that departs at an angle of greater than 45 degrees from either existing fork. This branch is ignored when placing diameters. The tree on the right also has two stems that clearly qualify as forks, plus a third stem that is within 45 degrees of one fork, but not the other. So long as it is within 45 degrees of an adjacent qualifying fork, it too is considered a fork. In this case, it is the third fork from approximately the same location on this tree and the **Measure Low Approach** must be applied.

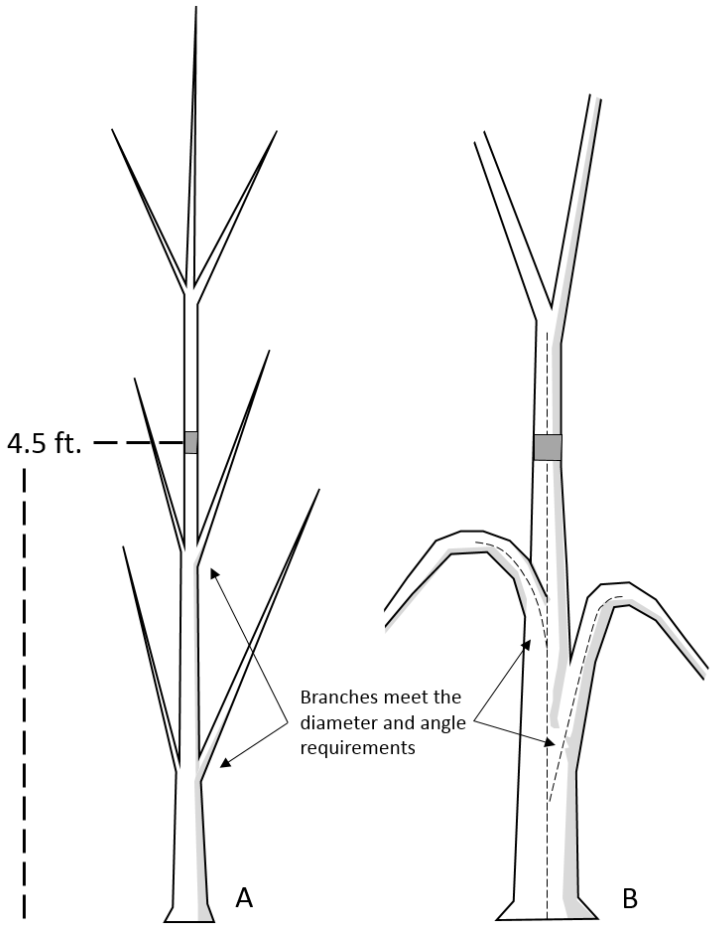


Figure 29. Forks that have branch-like form and function, leading to the tally of a single tree instead of multiple trees. In example A, although the potential fork is currently 1/3 the diameter of the main bole and is within 45 degrees of the main bole at the point of attachment, it appears to be serving as a branch as opposed to an additional independent tree. In addition, as the main bole continues to grow, the "branch" may reach the point where it is no longer 1/3 the main bole, dropping out of the inventory based on definition. Such potential forks would be ignored and the main bole would be tallied as a single tree with diameter measured at 4.5 feet. The tree is evaluated at each future visit and tallied following standard remeasurement procedures. In example B, although the potential fork is 1/3 the diameter of the main bole and is within 45 degrees of the main bole at point of attachment, it deviates drastically beyond 45 degrees about 1 inch from the main bole, taking on the form and function of a branch. This should be tallied as a single tree with diameter measured at 4.5 feet.

- Trees forked below 1.0 foot. Trees forked below 1.0 foot are treated as distinctly separate trees (fig. 30). Distances and azimuths are measured individually to the center of each stem where it splits from the stump (fig. 35 A-C). DBH is measured for each stem at 4.5 feet above the ground. When stems originate from pith intersections below 1 foot, it is possible for some stems to be within the limiting distance of the microplot or subplot, and others to be beyond the limiting distance. If stems originating from forks that occur below 1.0 foot fork again between 1.0 and 4.5 feet (fig. 35-E), the rules in the next paragraph apply.

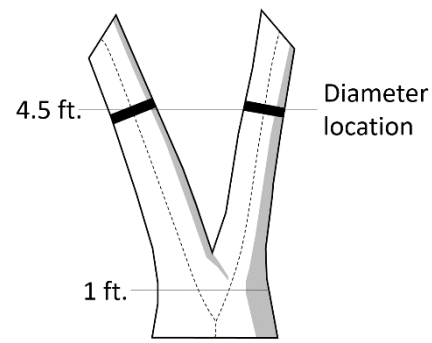


Figure 30. Forked below 1.0 foot.

- Trees forked between 1.0 foot and 4.5 feet. Trees forked between 1.0 foot and 4.5 feet are also counted as separate trees (fig. 31), but only one distance and azimuth (to the central stump) is recorded for each stem (fig. 35 D-F). Although a single azimuth and distance applies to all, multiple stems should be recorded as they occur in clockwise order (from front to back when one stem is directly in front of another). The DBH of each fork is measured at a point 3.5 feet above the pith intersection. When forks originate from pith intersections between 1.0 and 4.5 feet, the limiting distance is the same for all forks--they are either all on, or all off the plot.

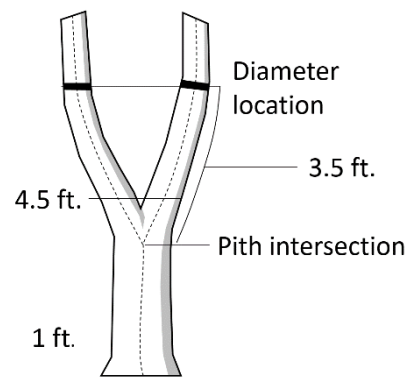


Figure 31. Forked between 1.0 foot and 4.5 feet.

Measure Low Approach

Crews may encounter trees of any species displaying growth forms with multiple forks that make applying traditional forking rules very difficult. In some instances these growth forms are species specific and in others they are the result of either the immediate growing conditions or the fact that the trees have been bred, pruned, or managed in a way that promotes multiple stems resulting in a specific crown shape.

In cases where such multiple forks (≥3) all originate from approximately the same point on the main stem, follow the **Measure Low Approach***,* where the diameter is taken at the highest, most repeatable location between the 1-foot stump and initial pith separation. This approach is applicable in instances where any of the following are present between the 1-foot stump and DBH (4.5 feet):

(1) Multiple forks (≥3) (fig. 32 D).

(2) Prolific branching originating from approximately the same location that prevents accurate and repeatable diameter (fig. 32 A and B). Prolific branching, as defined here, are those trees that often lack a defined main stem and/or qualifying forks, and take on a bushy appearance as the lower bole splits out into multiple branches at or below 4.5 feet. This is a rare situation that should not be confused with normal branching patterns that allow for accurate diameter placement (fig. 32 C).

(3) Any combination of multiple forks (≥3) and prolific branching originating at approximately the same location.

(4) The stems of a forked tree are grown together in such a fashion that an accurate DBH cannot be measured or estimated due to deformation resulting from the presence of the above mentioned criteria (fig. 33).

Figures 32 and 33 illustrate a combination of forks and or branches all originating at the approximate same location will trigger a measure low approach.

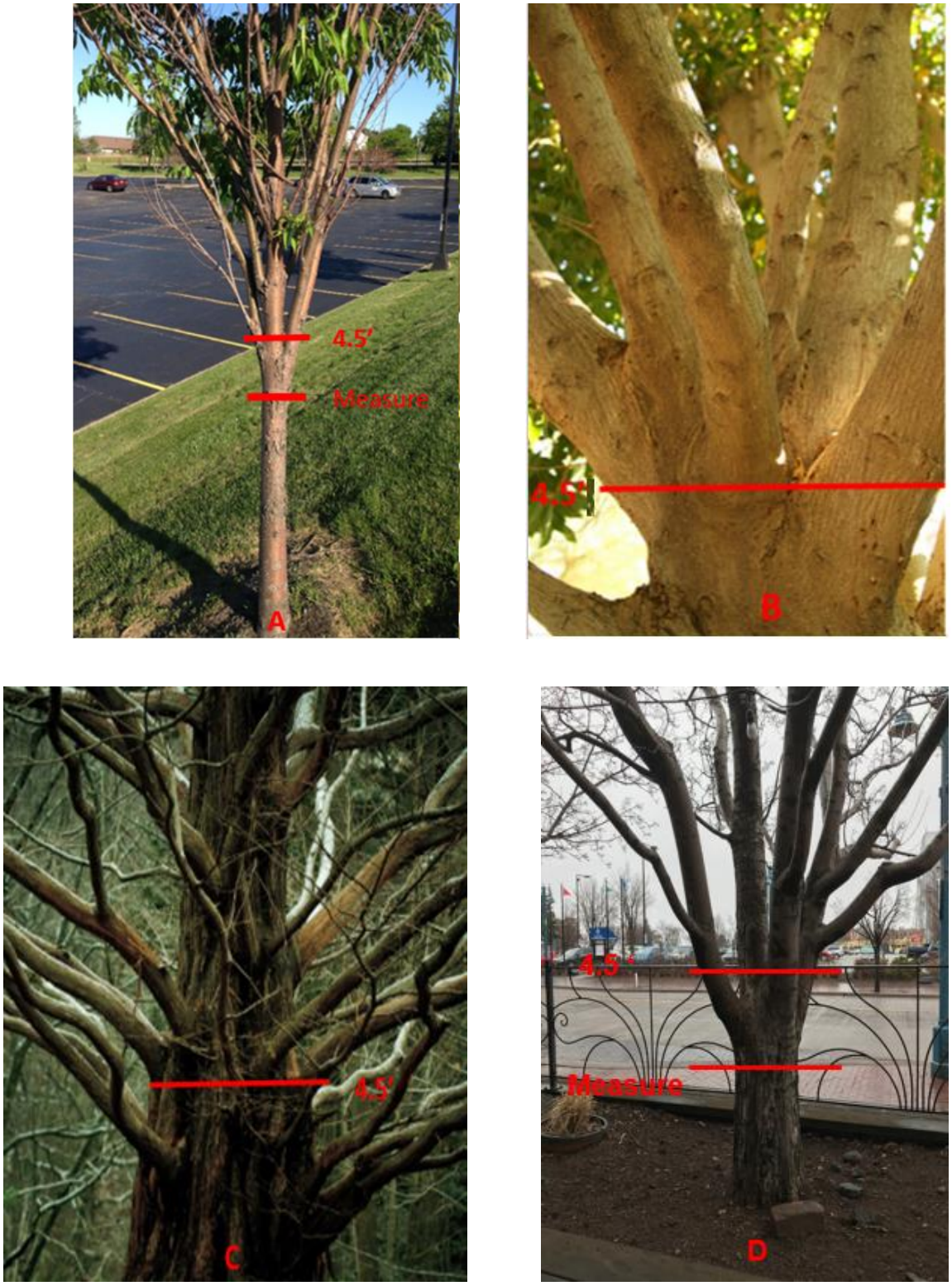


Figure 32. Both A and B are examples of Prolific Branching where the **Measure Low Approach** must be implemented causing the diameter to be taken below 4.5 feet. Although C has many branches, it is not a candidate for the **Measure Low Approach** because the branching is not deemed "Prolific"; traditional DBH measurement protocols would apply. D is an example of multiple forks originating from approximately the same area. Similar to Prolific Branching, the diameter is taken low, and D is treated as one tree.

A tree can only fork once. Following are specific procedures to **secondary** forking:

- Once a stem is tallied as a fork that originated from a pith intersection between 1.0 and 4.5 feet, do not recognize any additional forks (or potential forks) that may occur on that stem. Secondary forks need only meet the 1/3 diameter and 45 degree requirements to be considered forks; they do not need to be tree-like or 1 inch in diameter. When such secondary forks are encountered, measure/estimate the diameter of such stems at the most repeatable location below stem separation but above the **first** pith separation (fig. 35 F-I) while attempting to avoid measuring double piths (fig. 41) where possible (i.e., do not move the point of diameter the entire 3.5 feet above the first fork).

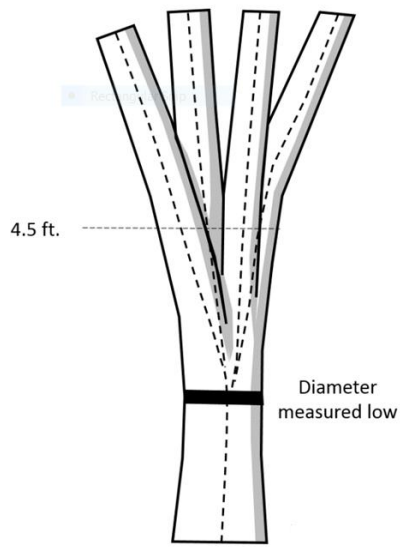


Figure 33. Using pith separation to determine diameter locations. In this example it is clear that all piths appear to separate from approximately the same location; this triggers the **"Measure Low Approach".** In cases where the piths do NOT originate within approximately the same location, normal forking rules are applied as demonstrated in figures 35 A-D and F-I.

- <u>Trees forked at or above 4.5 feet.</u> Trees forked at or above 4.5 feet count as one single tree (fig. 34). If a fork occurs at or immediately above 4.5 feet, measure diameter below the fork just beneath any swelling that would inflate DBH.

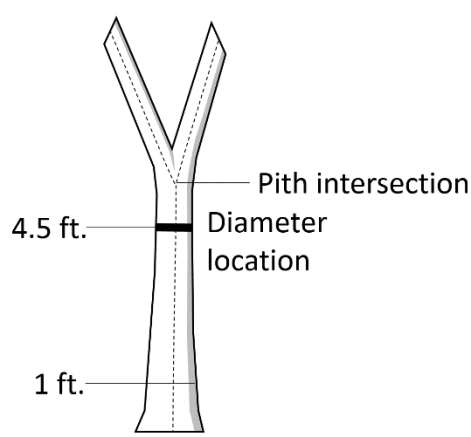


Figure 34. One Tree.

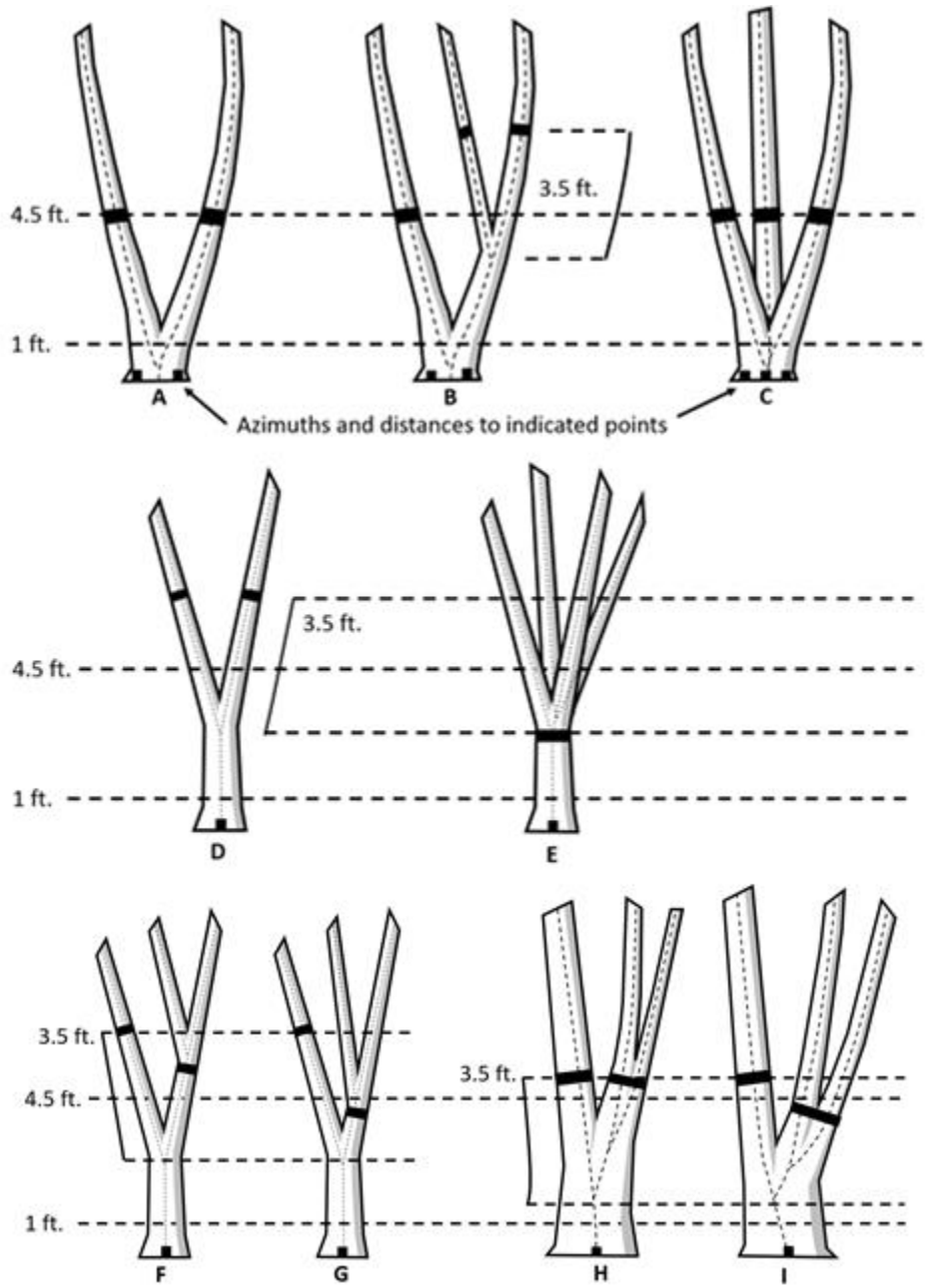


Figure 35 Summary of where to measure diameter, distance and azimuth on trees that fork below 1.0 foot (A, B, C) and trees that fork above 1.0 foot (D, E, F, G, H, I). Figure E represents the **"Measure Low Approach".** Figures F and G represent secondary forks with abnormal diameters at stem separation. Figures H and I represent secondary forks with normal diameters at stem separation.

2. Stump sprouts: Stump sprouts originate between ground level and 4.5 feet on the boles of trees that have died or been cut. Stump sprouts are handled the same as forked trees, with the exception that stump sprouts are not required to be 1/3 the diameter of the dead bole. Stump sprouts originating below 1.0 foot are measured at 4.5 feet from ground line. Stump sprouts originating between 1.0 foot and 4.5 feet are measured at 3.5 feet above their point of occurrence. As with forks, rules for measuring distance and azimuth depend on whether the sprouts originate above or below 1.0 foot. For multi-stemmed woodland species, treat all new sprouts as part of the same new tree.

3. Tree with butt-swell or bottleneck: Measure these trees 1.5 feet above the end of the swell or bottleneck if the swell or bottleneck extends 3.0 feet or more above the ground (fig. 36).

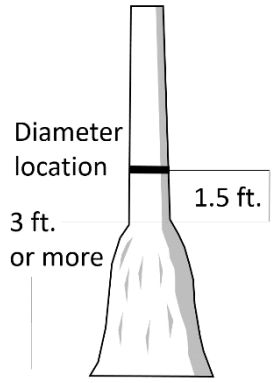


Figure 36. Bottleneck tree.

4. Tree with irregularities at DBH: On trees with swellings (fig. 37), bumps, depressions, and branches (fig. 38) at DBH, diameter will be measured immediately above the irregularity at the place it ceases to affect normal stem form. If the diameter point is out of reach above the irregularity, the diameter will be measured below the irregularity at the best repeatable location. If normal stem form does not exist, the diameter will be estimated at the prescribed location.

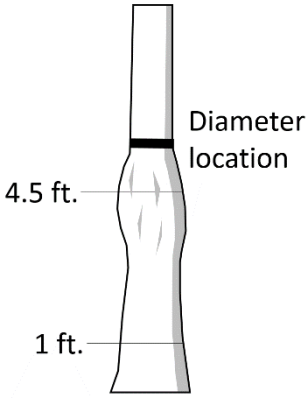


Figure 37. Tree with swelling.

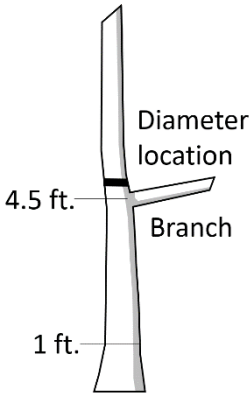


Figure 38. Tree with branch.

5. Tree on slope: Measure diameter at 4.5 feet from the ground along the bole on the uphill side of the tree (fig. 39).

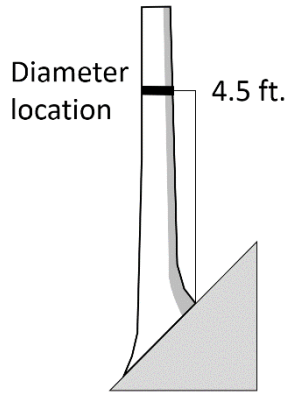


Figure 39. Tree on a slope.

6. Leaning tree: Measure diameter at 4.5 feet from the ground along the bole. The 4.5-foot distance is measured along the underside face of the bole (fig. 40).

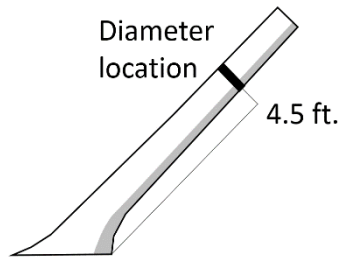


Figure 40. Leaning tree.

7. Turpentine tree: On trees with turpentine face extending above 4.5 feet, estimate the diameter at 10.0 feet above the ground and multiply by 1.1 to estimate DBH outside bark.

8. Independent trees that grow together: If two or more independent stems have grown together at or above the point of DBH, continue to treat them as separate trees. Estimate the diameter of each, set the "DIAMETER CHECK" code to 1, and explain the situation in the notes (fig. 41).

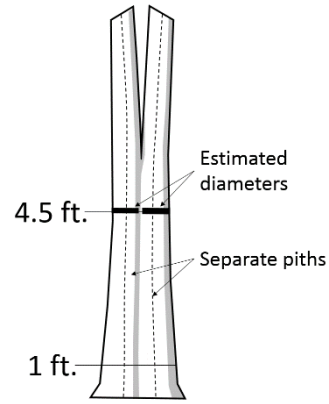


Figure 41. Independent trees grown together.

9. Missing wood or bark: Do not reconstruct the DBH of a tree that is missing wood or bark at the point of measurement. Record the diameter, to the nearest 0.1 inch, of the wood and bark that is still attached to the tree (fig. 42). If a tree has a localized abnormality (gouge, depression, etc.) at the point of DBH, apply the procedure described for trees with irregularities at DBH (fig.37).

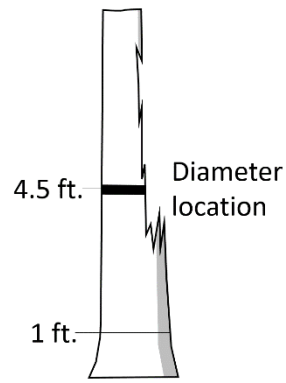


Figure 42. Tree with part of stem missing.

10. Live windthrown tree: Measure from the top of the root collar along the length to 4.5 feet (fig. 43).

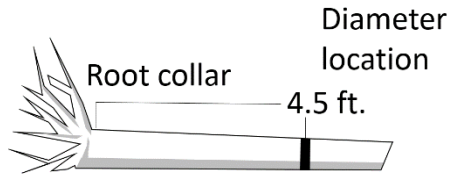


Figure 43. Tree on the ground.

11. Down live tree with tree-form branches growing vertical from main bole: When a down live tree, touching the ground, has vertical (less than 45 degrees from vertical) tree-like branches coming off the main bole, first determine whether or not the pith of the main bole (averaged along the first log of the tree) is above or below the duff layer.

- If the pith of the main bole is above the duff layer, use the same forking rules specified for a forked tree, and take all measurements accordingly (fig. 44).

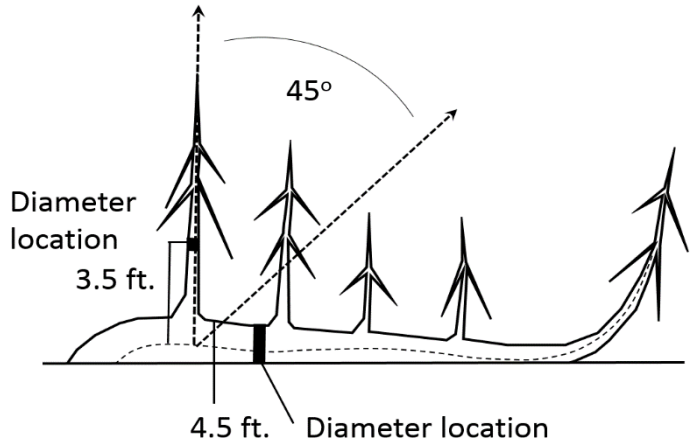


Figure 44. Down tree with pith above the duff.

- If the pith intersection of the main down bole and vertical tree-like branch occurs below 4.5 feet from the stump along the main bole, treat that branch as a separate tree, and measure DBH 3.5 feet above the pith intersection for both the main bole and the tree-like branch.

- If the intersection between the main down bole and the tree-like branch occurs beyond the 4.5 feet point from the stump along the main bole, treat that branch as part of the main down bole.

- If the pith of main tree bole is below the duff layer, ignore the main bole, and treat each tree-like branch as a separate tree; take DBH and length measurements from the ground, not necessarily from the top of the down bole (fig. 45). However, if the top of the main tree bole curves out of the ground towards a vertical angle, treat that portion of that top as an individual tree originating where the pith leaves the duff layer.

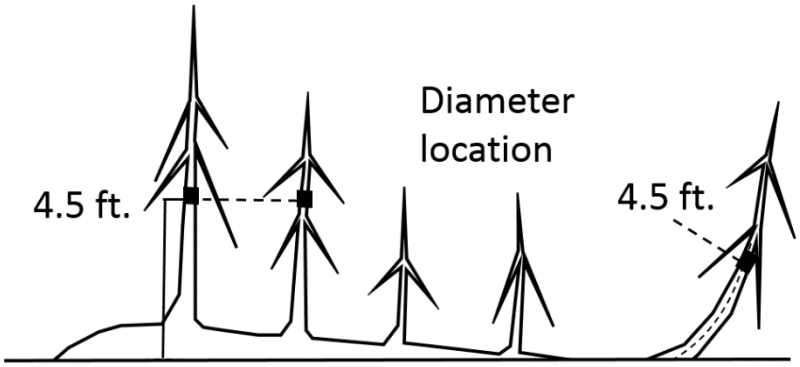


Figure 45. Down tree with pith below the duff.

12. Tree with curved bole (pistol butt tree): Measure along the bole on the uphill side (upper surface) of the tree (fig. 46).

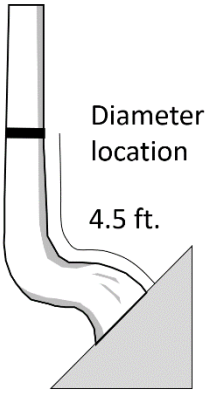


Figure 46. Tree with curved bole (pistol butt tree).

5.9.3 PREVIOUS DIAMETER AT ROOT COLLAR

This is the DRC assigned at the previous survey. It has been downloaded from the previous inventory. Any change made to this field signifies a misclassification at the time of the previous inventory. “DIAMETER CHECK” should be set to 2 and an explanation is required in the notes if previous DRC is changed.

5.9.4 Diameter At Root Collar (DRC)

For species requiring diameter at the root collar (refer to Appendix 3), measure the diameter at the ground line or at the stem root collar, whichever is higher. For these trees, treat clumps of stems having a unified crown and common root stock as a single tree; examples include mesquite, juniper, and mountain mahogany. Treat stems of woodland species such as Gambel oak and bigtooth maple as individual trees if they originate below the ground. For woodland trees, record DRC STEM DIAMETER and DRC STEM STATUS (described below). Then compute and record the DRC value from the individual stem diameter information.

Measuring woodland stem diameters: Before measuring DRC, remove the loose material on the ground (e.g., litter) but not mineral soil. Measure just above any swells present, and in a location so that the diameter measurements are a good representation of the volume in the stems (especially when trees are extremely deformed at the base). Stems must be at least 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point to qualify for measurement. Whenever DRC is impossible or extremely difficult to measure with a diameter tape (e.g., due to thorns, extreme number of limbs), stems may be estimated and recorded to the nearest 1.0-inch class. Additional instructions for DRC measurements are illustrated in figure 47. For each qualifying stem of the woodland tree, measure and record DRC STEM DIAMETER (5.9.4.1) and indicate the DRC STEM STATUS (5.9.4.2).

Computing and Recording DRC: For all tally trees requiring DRC, with at least one stem 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point, DRC is computed as the square root of the sum of the squared stem diameters. For a single-stemmed DRC tree, the computed DRC is equal to the single diameter measured.

Use the following formula to compute DRC:

$$DRC = SQRT\ [SUM\ (stem\ diameter^2)]$$

Round the result to the nearest 0.1 inch. For example, a multi-stemmed woodland tree with stems of 12.2, 13.2, 3.8, and 22.1 would be calculated as:

$$\begin{aligned} DRC &= SQRT\ (12.2^2 + 13.2^2 + 3.8^2 + 22.1^2) \\ &= SQRT\ (825.93) \\ &= 28.74 \\ &= 28.7 \end{aligned}$$

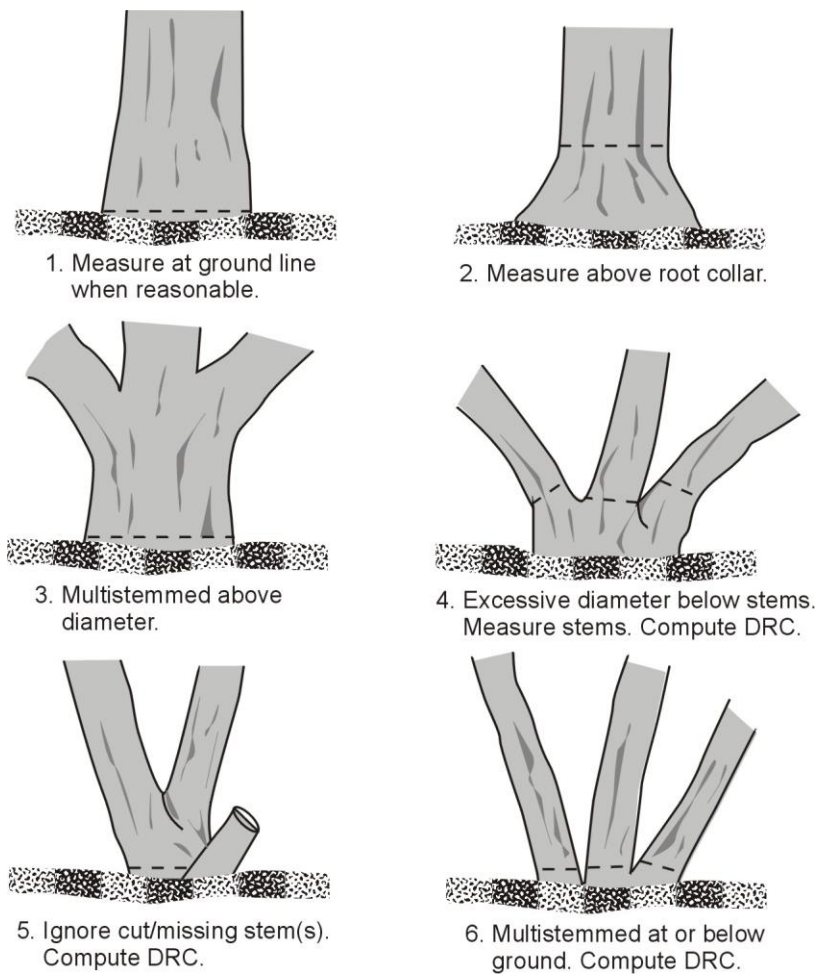


Figure 47. How to measure DRC in a variety of situations.

5.9.4.1 DRC STEM DIAMETER

Record the diameter of each individual qualifying stem on the woodland tree.

Values: 001.0 to 999.9

5.9.4.2 DRC STEM STATUS

Record the status of each individual stem on the woodland tally tree.

Values:

Value	Description
1	Live stem
2	Dead stem

5.10 PAST NUMBER OF STEMS

If the PAST NUMBER OF STEMS does not equal the CURRENT NUMBER OF STEMS, **do not** change the preprinted value. Make a note in TREE NOTES suggesting the possible reason for the difference.

Values: 1 to 99

5.11 CURRENT NUMBER OF STEMS

Record the total number of stems that were measured for DRC (e.g., record 1 stem as 01; record 12 stems as 12). Count only the number of qualifying stems used to calculate DRC. Qualifying stems are those that are at least 1.0 foot in length and at least 1.0 inch in diameter, 1 foot up from the measurement point.

Values: 1 to 99

5.12 DIAMETER CHECK

Record this code to identify the accuracy of the diameter measurement (due to factors such as abnormal swellings, diseases, damage, new measurement positions, etc.) that may affect use of this tree in diameter growth/change analyses.

Values:

Value	Description
0	Diameter measured accurately.
1	Diameter estimated.
2	Diameter measured at different location than previous measurement (remeasurement trees only).

Note: If both codes 1 and 2 apply, use code 2.

Note: If either code 1 or code 2 is used, a tree-level note is required.

5.13 ROTTEN/MISSING CULL

Record the percent rotten or missing cubic-foot cull for all live tally trees greater than or equal to 5.0 inches DBH/DRC (CORE) and all standing dead tally trees greater than or equal to 5.0 inches DBH/DRC (CORE OPTIONAL).

Record the percentage of rotten and missing cubic-foot volume, to the nearest 1 percent. When estimating volume loss (tree cull), only consider the cull on the merchantable bole/portion of the tree, from a 1-foot stump to a 4-inch DOB top. Do not include any cull estimate above ACTUAL

LENGTH. For woodland species, the merchantable portion is between the point of DRC measurement to a 1.5-inch DOB top.

Rotten and missing volume loss is often difficult to estimate. Refer to supplemental disease and insect pests field guides and local defect guidelines as an aid in identifying damaging agents and their impact on volume loss. Use your best judgment and be alert to such defect indicators as the following:

- Cankers or fruiting bodies.
- Swollen or punky knots.
- Dull, hollow sound of bole (use regional standards).
- Large dead limbs, especially those with frayed ends.
- Sawdust around the base of the tree.
- Metal imbedded in the wood.

Values: 00 to 99

5.14 TOTAL LENGTH

Record the TOTAL LENGTH of the tree, to the nearest 1.0 foot from ground level to the top of the tree. For trees growing on a slope, measure on the uphill side of the tree. If the tree has a missing top (top is broken and completely detached from the tree), estimate what the total length would be if there were no missing top. Forked trees should be treated the same as unforked trees.

Values: 001 to 400

5.15 ACTUAL LENGTH

Record for trees with missing tops (top on live trees is completely detached; top on dead trees is greater than 50 percent detached from the tree). If the top is intact, this item may be omitted. Record the ACTUAL LENGTH of the tree to the nearest 1.0 foot from ground level to the break. Use the length to the break for ACTUAL LENGTH until a new leader qualifies as the new top for TOTAL LENGTH; until that occurs, continue to record ACTUAL LENGTH to the break. Trees with previously broken tops are considered recovered (i.e., ACTUAL LENGTH = TOTAL LENGTH) when a new leader (dead or alive) is 1/3 the diameter of the broken top at the point where the top was broken (not where the new leader originates from the trunk). Forked trees should be treated the same as unforked trees.

Note: Some regions will measure ACTUAL LENGTH differently due to growth form. Some examples are swamp tupelo, cypress, and trees growing off of old high stumps with stilted roots in the West. Check regional field guides for regional guidance.

Values: 001 to 400

5.16 LENGTH METHOD

Record the code that indicates the method used to determine tree lengths.

Values:

Value	Description
1	Total and actual lengths are field measured with a measurement instrument (e.g., clinometer, relascope, tape).
2	Total length is visually estimated, actual length is measured with an instrument.
3	Total and actual lengths are visually estimated.

5.17 CROWN CLASS

Rate tree crowns in relation to the sunlight received and proximity to neighboring trees (fig. 48). Base the assessment on the position of the crown at the time of observation. Example: a formerly overtopped tree that is now dominant due to tree removal is classified as dominant.

Values:

Value	Description
1	Open Grown – trees with crowns that received full light from above and from all sides throughout most of its life, particularly during its early developmental period.
2	Dominant – trees with crown extending above the general level of the crown canopy and receiving full light from above and partly from the sides. These trees are taller than the average trees in the stand and their crowns are well developed, but they could be somewhat crowded on the sides. Also, trees whose crowns have received full light from above and from all sides during early development and most of their life. Their crown form or shape appears to be free of influence from neighboring trees.
3	Co-dominant – trees with crowns at the general level of the crown canopy. Crowns receive full light from above but little direct sunlight penetrates their sides. Usually they have medium-sized crowns and are somewhat crowded from the sides. In stagnated stands, co-dominant trees have small-sized crowns and are crowded on the sides.
4	Intermediate – trees that are shorter than dominants and co-dominant, but their crowns extend into the canopy of co-dominant and dominant trees. They receive little direct light from above and none from the sides. As a result, intermediate trees usually have small crowns and are very crowded from the sides.
5	Overtopped – trees with crowns entirely below the general level of the crown canopy that receive no direct sunlight either from above or the sides.

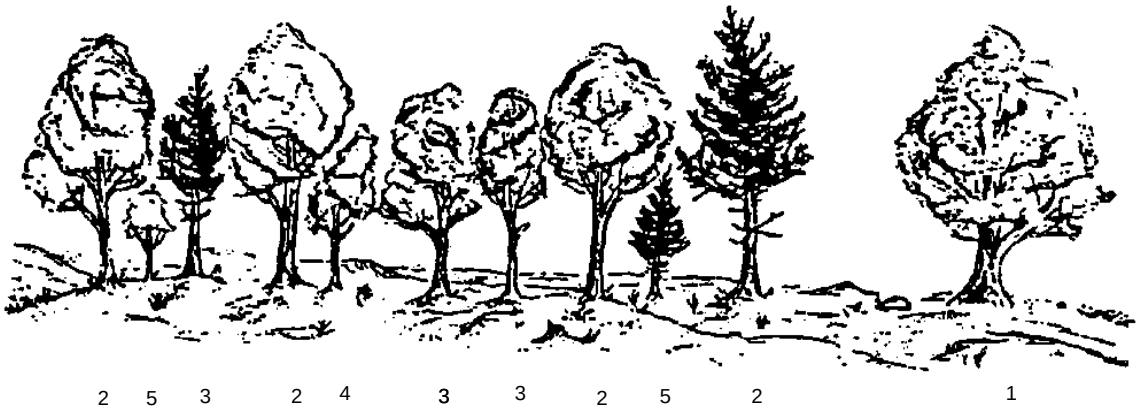


Figure 48. Examples of CROWN CLASS code definitions (numbers are the CROWN CLASS codes).

5.18 UNCOMPACTED LIVE CROWN RATIO (Phase 2 – CORE OPTIONAL, Phase 3 – CORE)

Record the UNCOMPACTED LIVE CROWN RATIO to the nearest one percent. UNCOMPACTED LIVE CROWN RATIO is the percentage of actual tree length supporting live foliage (or in cases of extreme defoliation should be supporting live foliage) that is effectively contributing to tree growth. UNCOMPACTED LIVE CROWN RATIO is determined by the ratio of live crown length to ACTUAL LENGTH (fig. 49). Live crown length is determined from the last live foliage at the crown top (dieback in the upper portion of the crown is not part of the live crown) to the “base of live crown”. Many times there are additional live branches below the “base of live crown”. These branches are only included if they have a basal diameter greater than 1 inch and are within 5 feet of the base of the obvious live crown. The live crown base becomes that point on the main bole perpendicular to the lowest live foliage on the last branch that is included in the live crown. The live crown base is determined by the live foliage and not by the point where a branch intersects with the main bole.

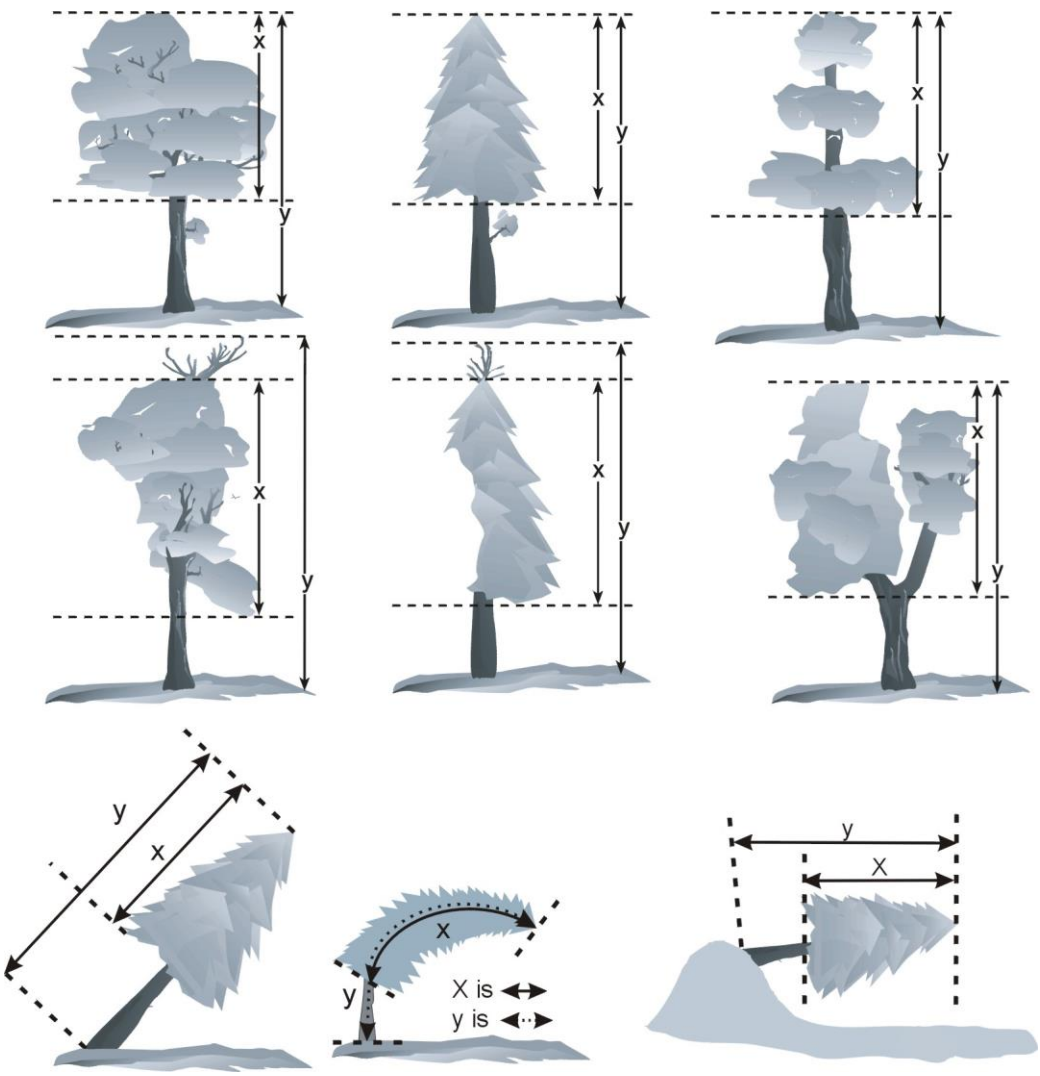


Figure 49. UNCOMPACTED LIVE CROWN RATIO examples.

Determine sapling UNCOMPACTED LIVE CROWN RATIO by dividing the live crown length by ACTUAL LENGTH. Live crown length is the distance between the top live foliage (dieback and

dead branches are not included) and the lowest live twig for saplings. The live crown base for saplings is different from trees 5.0 inches DBH/DRC and larger; the 1-inch/5-foot rule does not apply in this case. Do not include sprigs or leaves on the main stem below the lowest live twig (fig. 50).

Values: 00 to 99 percent

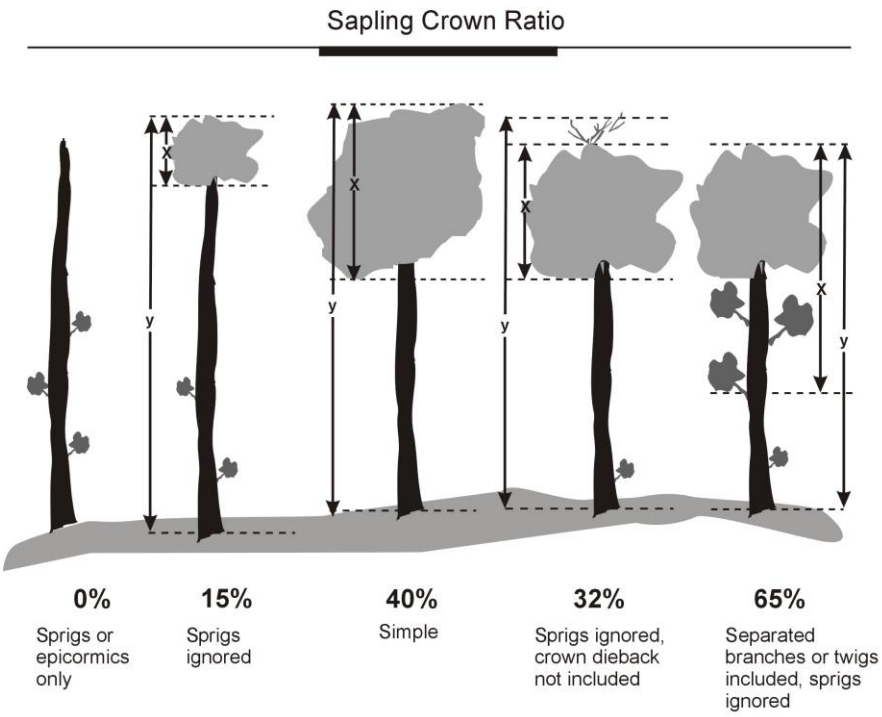


Figure 50. Sapling ratio determination examples.

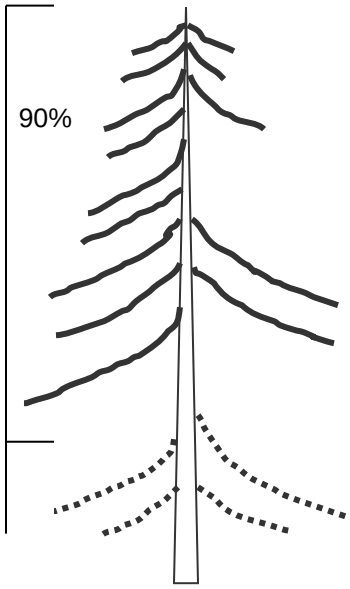
5.19 COMPACTED CROWN RATIO

Record the COMPACTED CROWN RATIO for each live tally tree, 1.0 inch and larger, to the nearest one percent. COMPACTED CROWN RATIO is that portion of the tree supporting live foliage (or in the case of extreme defoliation should be supporting live foliage) and is expressed as a percentage of the actual tree length. To determine COMPACTED CROWN RATIO, ocularly transfer lower live branches to fill in large holes in the upper portion of the tree until a full, even crown is visualized.

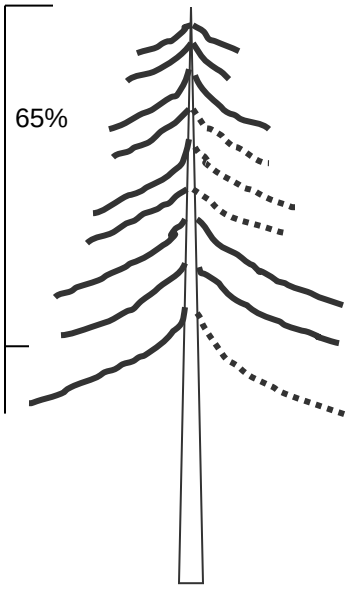
Do not over-compact trees beyond their typical full crown situation. For example, if tree branches tend to average 2 feet between whorls, do not compact crowns any tighter than the 2-foot spacing (fig. 51). Figure 52 shows an example of COMPACTED CROWN RATIO on a leaning tree.

Open-crown conifer (e.g., ponderosa pine) –

Uncompacted:

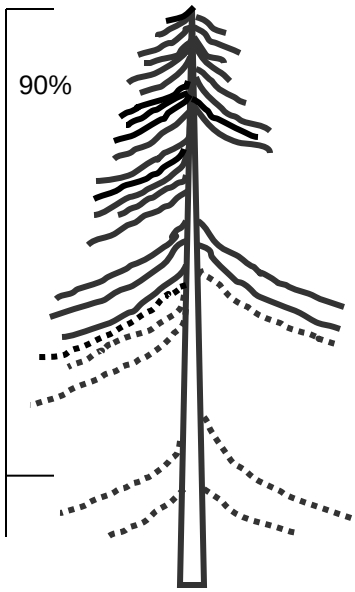


Compacted:



Dense-crown conifer (e.g., subalpine fir) –

Uncompacted:



Compacted:

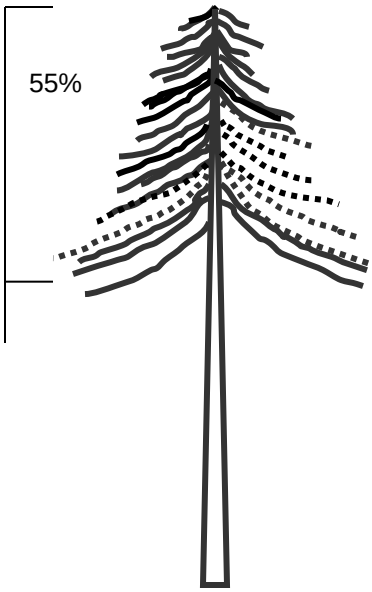


Figure 51. Examples of and comparison between COMPACTED CROWN RATIO and UNCOMPACTED LIVE CROWN RATIO of conifers.

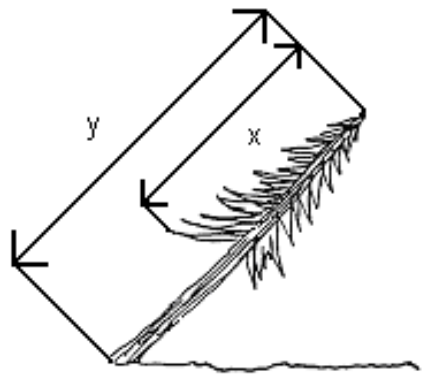


Figure 52. COMPACTED CROWN RATIO on a leaning tree. CROWN RATIO = (x/y)100.

For multi-stemmed woodland species, ocularly transfer lower live foliage to fill large holes on all stems and form an even crown across the tree (fig. 53).

Values: 00 to 99

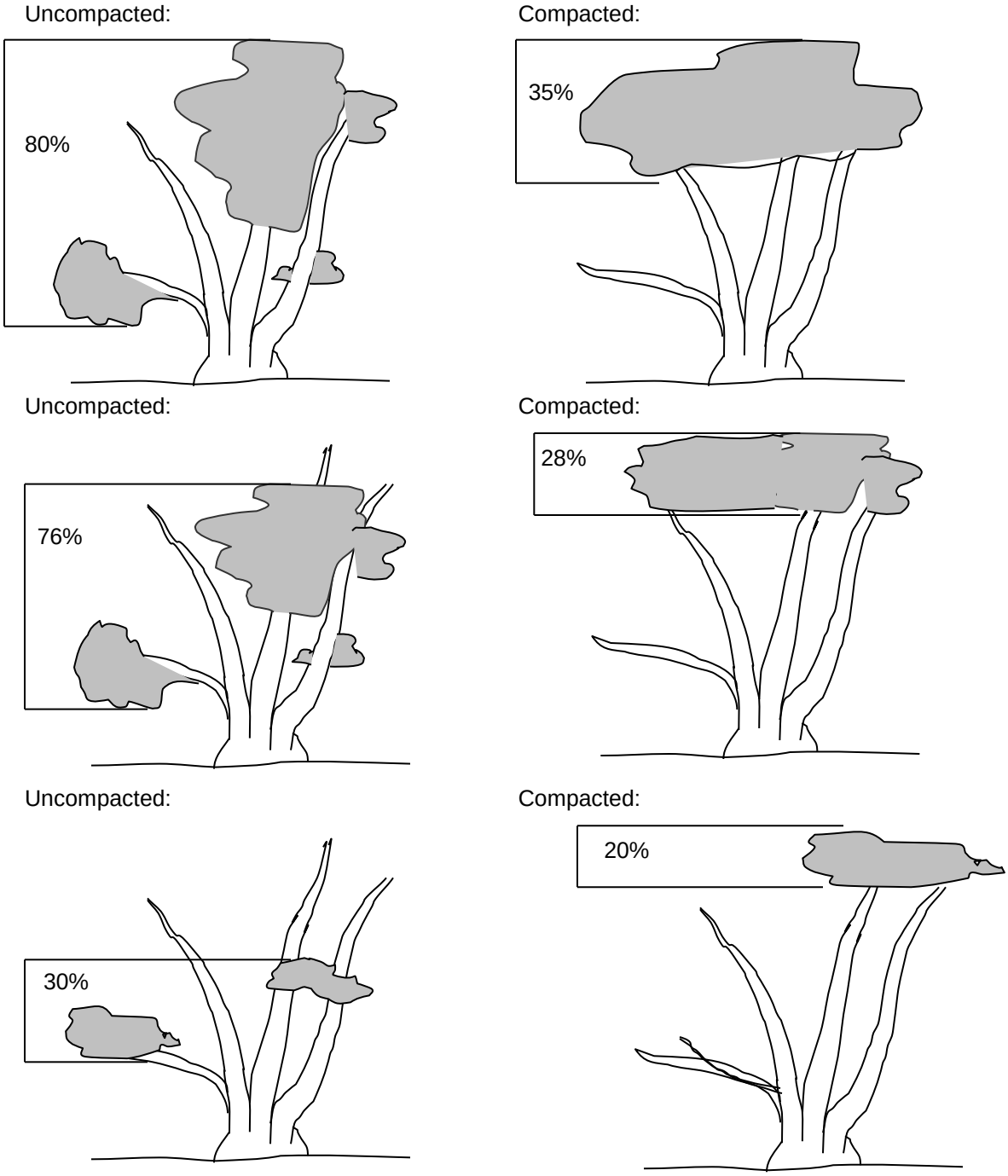


Figure 53. Examples of and comparison between COMPACTED CROWN RATIO and UNCOMPACTED LIVE CROWN RATIO of woodland species.

5.20 Tree Damage (CORE)

Damage is a composite variable. Up to three damaging agents may be recorded per tree. Many damaging agents are host specific and their potential for damage could vary by region. In general, a recorded damage is likely to:

1. Prevent the tree from surviving more than 1-2 years
2. Reduce the growth of the tree in the near term
3. Negatively affect a tree's marketable products (cubic, BF, or other)

It is not necessary to record damage agents in order of their severity unless there are more than three agents. If there are more than three agents, record only the most important ones using the list of impacts above as a guide (i.e., agents threatening survival are more important than agents that reduce wood quality). In general, agents that affect the roots or bole tend to be most threatening, because they have the capacity to affect the entire tree; damage to peripheral parts of the tree may be temporary because leaves, shoots, and reproductive structures may be replaced.

Codes used for this variable come from a January 2012 Pest Trend Impact Plot System, (PTIPS) list from the Forest Health Technology Enterprise Team (FHTET) that has been modified to meet FIA needs. This list is made up of General Agents and then further subdivided into specific agents. Not every General Agent PTIPS code will be available for use for this variable; some do not cause tree damage as defined above while others are better recorded in a different General Agent. Not every specific agent PTIPS code will be available for use for this variable. Regions will decide which specific agents they will identify in their areas.

Record the general agent unless the Region opts to collect specific agents. Specific agents can later be collapsed into the general agent categories for cross-region comparisons. In the unusual instance when more than one specific agent in the same general category occurs on the same tree, record them both. If a specific agent is identified on that plot but that agent is not on the regionally recognized list of codes for damage agents, use its General Agent code. Appendix 11 contains the regionally recognized list of codes for damage agent based on the modified PTIPS list from FHTET. Only the specific agent codes from appendix 11 may be used instead of the general codes listed under DAMAGE AGENT 1. Any damage code in appendix 11 may be used for DAMAGE AGENT 1, DAMAGE AGENT 2, or DAMAGE AGENT 3

5.20.1 DAMAGE AGENT 1

Inspect the tree from bottom to top – roots, bole, branches, foliage (including buds and shoots), Record the first damage agent observed from the list of agents (unless you observe more than 3 damages). If there are more than three agents, record only the most important ones using the list of impacts listed in section 5.20 as a guide (i.e., agents threatening survival are more important than agents that reduce wood quality). The general agent codes, damage thresholds, and general agent descriptions are listed here. Specific agents within the general categories, if required by your Region, are listed in appendix 11, along with their associated thresholds. These codes can be collapsed into the national core general codes. Note: in some cases, thresholds for specific agents may be different from the threshold for the corresponding general agent. If a region is collecting a specific insect agent and no one is collecting the general agent, then the specific insect agent is collapsed into the general insect category 10000.

Values:

General Agent Damage Codes, Damage Thresholds, and Descriptions. Specific agent codes are in appendix 11.

Code	General Agent	Damage Threshold*	Descriptions
0		No damage	

Code	General Agent	Damage Threshold*	Descriptions
10000	General insects	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Insect damage that cannot be placed in any of the following insect categories.
11000	Bark beetles	Any evidence of a successful attack (successful attacks generally exhibit boring dust, many pitch tubes and/or fading crowns).	Bark beetles (*Dendroctonus*, *Ips*, and other genera) are phloem-feeding insects that bore through the bark and create extensive galleries between the bark and the wood. Symptoms of beetle damage include fading or discolored tree crown (yellow or red), pitch tubes or pitch streaks on the bark, extensive egg galleries in the phloem, boring dust in the bark crevices or at the base of the tree. Bark chipping by woodpeckers may be conspicuous. They inflict damage or destroy all parts of trees at all stages of growth by boring in the bark, inner bark, and phloem. Visible signs of attack include pitch tubes or large pitch masses on the tree, dust and frass on the bark and ground, and resin streaming. Internal tunneling has various patterns. Most have tunnels of uniform width with smaller galleries of variable width radiating from them. Galleries may or may not be packed with fine boring dust.
12000	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	These are foliage-feeding insects that may reduce growth and weaken the tree causing it to be more susceptible to other damaging agents. General symptoms of defoliation damage include large amounts of missing foliage, browning foliage, extensive branch mortality, or dead tree tops.
13000	Chewing insects Note: this is only collected by IW and SRS	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	Insects, like grasshoppers and cicadas that chew on trees (those insects not covered by defoliators in code 12000).
14000	Sucking insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	Adelgids, scales and aphids feed on all parts of the tree. Often they cause galling on branches and trunks. Some appear benign but enable fungi to invade where they otherwise could not (e.g., beech bark disease). The most important ones become conspicuous because of the mass of white, cottony wax that conceals eggs and young nymphs.

Code	General Agent	Damage Threshold*	Descriptions
15000	Boring insects	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches.	Most wood boring insects attack only severely declining and dead trees. Certain wood boring insects cause significant damage to trees, especially the exotic Asian longhorn beetle, emerald ash borer, and Sirex wood wasp. Bark beetles have both larval and adult galleries in the phloem and adjacent surface of the wood. Wood borers have galleries caused only by larval feeding. Some, such as the genus *Agrilus* (including the emerald ash borer) have galleries only in the phloem and surface of the wood. Other wood borers, such as Asian longhorn beetle bore directly into the phloem and wood. Sirex adults oviposit their eggs through the bark, and developing larvae bore directly into the wood of pines.
19000	General diseases	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Diseases that cannot be placed in any of the following disease categories.
21000	Root/butt diseases	Any occurrence.	Root disease kills all or a portion of a tree's roots. Quite often, the pathogenic fungus girdles the tree at the root collar. Tree damage includes mortality (often occurring in groups or "centers"), reduced tree growth, and increased susceptibility to other agents (especially bark beetles). General symptoms include resin at the root collar, thin, chlorotic (faded) foliage, and decay of roots. A rot is a wood decay caused by fungi. Rots are characterized by a progression of symptoms in the affected wood. First, the wood stains and discolors, then it begins to lose its structural strength, and finally the wood starts to break down, forming cavities in the stem. Even early stages of wood decay can cause cull due to losses in wood strength and staining of the wood. Rot can lead to mortality, cull, an increased susceptibility to other agents (such as insects), wind throw, and stem breakage.

Code	General Agent	Damage Threshold*	Descriptions
22000	Cankers (non-rust)	Any occurrence.	A canker -- a sunken lesion on the stem caused by the death of cambium -- may cause tree breakage or kill the portion of the tree above the canker. Cankers may be caused by various agents but are most often caused by fungi. A necrotic lesion begins in the bark of branches, trunk or roots, and progresses inward killing the cambium and underlying cells. The causal agent may or may not penetrate the wood. This results in areas of dead tissue that become deeper and wider. There are two types of cankers, annual and perennial. Annual cankers enlarge only once and do so within an interval briefer than the growth cycle of the tree, usually less than one year. Little or no callus is associated with annual cankers, and they may be difficult to distinguish from mechanical injuries. Perennial cankers are usually the more serious of the two, and grow from year to year with callus forming each year on the canker margin, often resulting in a target shape. The most serious non-rust cankers occur on hardwoods, although branch mortality often occurs on conifers.
22500	Stem decays	Any visual evidence (conks; fruiting bodies; rotten wood)	Rot occurring in the bole/stems of trees above the roots and stump.
23000	Parasitic / Epiphytic plants	Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes and vines covering ≥ 50% of crown.	Parasitic and epiphytic plants can cause damage to trees in a variety of ways. The most serious ones are dwarf mistletoes, which reduce growth and can cause severe deformities. Vines may damage trees by strangulation, shading, or physical damage. Benign epiphytes, such as lichens or mosses, are not considered damaging agents.
24000	Decline Complexes/ Dieback/Wilts	Damage ≥ 20% dieback of crown area.	Tree disease which results not from a single causal agent but from an interacting set of factors. Terms that denote the symptom syndrome, such as dieback and wilt, are commonly used to identify these diseases**.**
25000	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Foliage diseases are caused by fungi and result in needle shed, growth loss, and, potentially, tree mortality. This category includes needle casts, blights, and needle rusts.

Code	General Agent	Damage Threshold*	Descriptions
26000	Stem rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	A stem rust is a disease caused by fungi that kill or deform all or a portion of the stem or branches of a tree. Stem rusts are obligate parasites and host specialization is very common. They infect and develop on fast-growing tissues and cause accelerated growth of infected tissues resulting in galls or cankers. Heavy resinosis is usually associated with infections. Sometimes yellow or reddish-orange spores are present giving a “rusty” appearance. Damage occurs when the disease attacks the cambium of the host, girdling and eventually killing the stem above the attack. Symptoms of rusts include galls (an abnormal and pronounced swelling or deformation of plant tissue that forms on branches or stems) and cankers (a sunken lesion on the stem caused by death of the cambium which often results in the death of tree tops and branches).
27000	Broom rusts	≥50% of crown area affected.	Broom rust is a disease caused by fungi that kill or deform all or a portion of the branches of a tree. Broom rusts are obligate parasites and host specialization is very common. They infect and develop on fast-growing tissues and cause accelerated growth of infected tissues resulting in galls. Symptoms of rusts include galls, an abnormal and pronounced swelling or deformation of plant tissue that forms on branches or stems.
30000	Fire	Damage ≥ 20% of bole circumference; >20% of stems on multi-stemmed woodland species affected; ≥20% of crown affected.	Fire damage may be temporary, such as scorched foliage, or may be permanent, such as in cases where cambium is killed around some portion of the bole. The location and amount of fire damage will determine how the damage may affect the growth and survival of the tree. Fire often causes physiological stress, which may predispose the tree to attack by insects of other damaging agents.
41000	Wild animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Wild animals from birds to large mammals cause open wounds. Some common types of damage include: sapsucker bird peck, deer rub, bear clawing, porcupine feeding, and beaver gnawing.

Code	General Agent	Damage Threshold*	Descriptions
42000	Domestic animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Open wounds caused by cattle and horses occur on the roots and lower trunk. Soil compaction from the long term presence of these animals in a woodlot can also cause indirect damage.
50000	Abiotic	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Abiotic damages are those that are not caused by other organisms. In some cases, the type and severity of damage may be similar for different types of agents (e.g., broken branches from wind, snow, or ice).
60000	Competition	Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC).	Suppression of overtopped shade intolerant species. Trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC).
70000	Human activities	Any damage to the terminal leader, damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	People can injure trees in a variety of ways, from poor pruning, to vandalism, to logging injury. Signs include open wounds or foreign embedded objects.
71000	Harvest	Removal of ≥10% of cubic volume	Only recorded for woodland species trees that have partial cutting
90000	Other damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	

Code	General Agent	Damage Threshold*	Descriptions
99000	Unknown damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Use this code only when observed damage cannot be attributed to a general or specific agent.

***** Some Regional specific damage agents within a category may have differing damage thresholds.

5.20.2 DAMAGE AGENT 2

Follow procedures described for DAMAGE AGENT 1

Values: See 5.20.1

5.20.3 DAMAGE AGENT 3

Follow procedures described for DAMAGE AGENT 1

Values: See 5.20.1

5.21 CAUSE OF DEATH

Record a cause of death for all trees that have died or been cut since the previous survey. If cause of death cannot be reliably estimated, record unknown/not sure/other.

Values:

Value	Description
10	Insect
20	Disease
30	Fire
40	Animal
50	Weather
60	Vegetation (suppression, competition, vines/kudzu)
70	Unknown/not sure/other - includes death from human activity not related to silvicultural or landclearing activity (accidental, random, etc.). TREE NOTES required.
80	Silvicultural or landclearing activity (death caused by harvesting or other silvicultural activity, including girdling, chaining, etc., or to landclearing activity)

5.22 MORTALITY YEAR (CORE OPTIONAL)

Record the estimated year that remeasured trees died or were cut. For each remeasured tree that has died or been cut since the previous inventory, record the 4-digit year in which the tree died. Mortality year is also recorded for trees on land that has been converted to a nonforest land use, if it can be determined that a tree died before the land was converted.

Values: 1994 or higher

5.23 DECAY CLASS

Record for each standing dead tally tree, 1.0 inch in diameter and larger, the code indicating the tree's stage of decay.

Values: Use the following table for guidelines:

Decay class stage (code)	Limbs and branches	Top	% Bark Remaining	Sapwood presence and condition*	Heartwood condition*
1	All present	Pointed	100	Intact; sound, incipient decay, hard, original color	Sound, hard, original color
2	Few limbs, no fine branches	May be broken	Variable	Sloughing; advanced decay, fibrous, firm to soft, light brown	Sound at base, incipient decay in outer edge of upper bole, hard, light to reddish brown
3	Limb stubs only	Broken	Variable	Sloughing; fibrous, soft, light to reddish brown	Incipient decay at base, advanced decay throughout upper bole, fibrous, hard to firm, reddish brown
4	Few or no stubs	Broken	Variable	Sloughing; cubical, soft, reddish to dark brown	Advanced decay at base, sloughing from upper bole, fibrous to cubical, soft, dark reddish brown
5	None	Broken	Less than 20	Gone	Sloughing, cubical, soft, dark brown, OR fibrous, very soft, dark reddish brown, encased in hardened shell

*Characteristics are for Douglas-fir. Dead trees of other species may vary somewhat. Use this only as a guide.

5.24 LENGTH TO DIAMETER MEASUREMENT POINT

Record this item when tree diameter measurement locations are not monumented. For those trees measured directly at 4.5 feet above the ground, leave this item blank. If the diameter is not measured at 4.5 feet, record the actual length from the ground, to the nearest 0.1 foot, at which the diameter was measured for each tally tree, 1.0 inch DBH and larger. Leave this item blank for woodland species measured for diameter at root collar.

Values: 00.1 – 15.0

5.25 ROUGH CULL (CORE OPTIONAL)

For each live tally tree 5.0 inches DBH/DRC and larger, record the total percentage of cubic-foot volume that is cull due to sound dead material or tree form. Record to the nearest 1 percent. When estimating volume loss (tree cull), only consider the cull on the merchantable bole/portion of the tree, from a 1-foot stump to a 4-inch top.

For woodland species, the merchantable portion is between the point of DRC measurement to a 1.5-inch DOB top, and rough cull includes only sound dead.

Refer to local defect guidelines as an aid in determining cull volume for various damages such as crook, fork, sweep, pistol butt, etc. Small trees (5-9 inches for softwoods and 5-11 inches for hardwoods) that have poor form and are not expected to ever produce merchantable material should be coded 99% rough cull.

Values: 00 to 99

5.26 DWARF MISTLETOE CLASS (CORE OPTIONAL)

Rate all live conifer species, except juniper species, greater than or equal to 1.0 inch diameter for dwarf mistletoe (*Arceuthobium* spp.) infection. Use the Hawksworth six-class rating system: divide the live crown into thirds, and rate each third using the following scale (fig. 54):

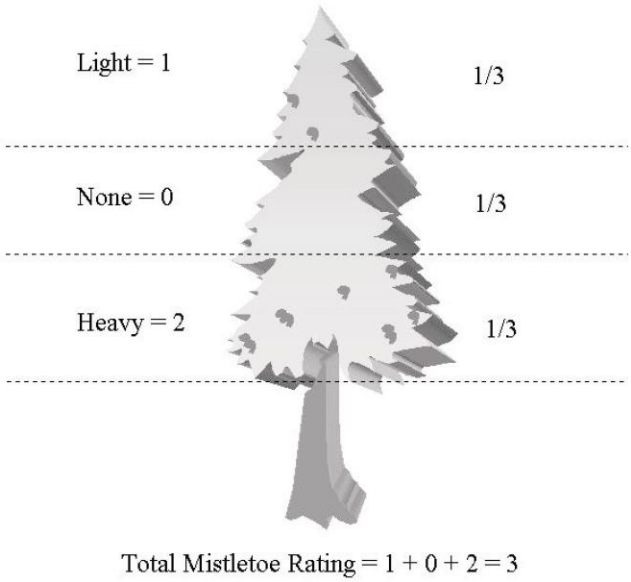


Figure 54. Example of the Hawksworth six-class rating system.

0	No visible infection
1	Light infection -- < 50 percent of the total branches infected
2	Heavy infection -- > 50 percent of the total branches infected

Sum the three individual ratings to obtain and record a total mistletoe class (0 to 6) for the tree.

Note: In addition to these requirements, longleaf pine (0121) seedlings must be greater than or equal to 0.5 inches DRC.

Values: 0 to 6

5.27 TREE NOTES

Record notes pertaining to an individual tree as called for to explain or describe another variable.

Values: English language words, phrases and numbers

6.0 SEEDLING DATA

Regeneration information is obtained by counting live seedlings within the 6.8-foot radius microplot located 90 degrees and 12.0 feet from each subplot center within each of the four subplots. Conifer seedlings must be at least 6.0 inches in length and less than 1.0 inch at DBH/DRC in order to qualify for tallying. Hardwood seedlings must be at least 12.0 inches in length and less than 1.0 inch at DBH/DRC in order to qualify for tallying. For woodland species, each stem on a single tree must be less than 1.0 inch in DRC. Seedlings are counted in groups by species and condition class, up to five individuals per species. Counts beyond five estimated. Only count seedlings occurring in accessible forest land condition classes.

6.1 SUBPLOT NUMBER

Use the same procedures described in Section 3.1.

6.2 SPECIES

Use the same procedures described in Section 5.8.

Values: See Appendix 3

6.3 CONDITION CLASS NUMBER

Use the same procedures described in Section 2.0.

6.4 SEEDLING COUNT

On each microplot, record the number of live tally tree seedlings, by species and condition class. Count up to five individuals by species: estimate the total count if there are more than five individuals of any given species in any given condition class. When seedlings are distributed evenly on a microplot, a suggested method of estimating is to count the number of seedlings on one quarter of the microplot and multiply by four (given that there is only one condition class on the microplot). Repeat for each species. Conifer seedlings must be at least 6.0 inches in length and less than 1.0 inch at DBH to qualify for counting. Hardwood seedlings must be at least 12.0 inches in length and less than 1.0 inch at DBH in order to qualify for counting.

For woodland species, each stem on a single tree must be less than 1.0 inch at DRC.

Multiple “suckers” that originate from the same location, and stump sprouts are considered one seedling. Do not tally or count “layers” (undetached branches partially or completely covered by soil, usually at the base) as seedlings. Do not tally any seedlings that sprout from a live tally tree.

Values: 001 through 999

7.0 SITE TREE INFORMATION

Site trees are a measure of site productivity expressed by the height to age relationship of dominant and co-dominant trees. If suitable site trees are available, site tree data are required for every accessible forest land condition class defined on a plot. An individual site tree may be used for more than one condition class where differences in condition classes are not the result of differences in site productivity. For example, when different condition classes are caused solely due to differences in reserved status, owner class, and/or disturbance-related differences in density (e.g., heavily thinned vs. unthinned), a site tree may be used for more than one condition class. When in doubt, do not use a site tree for more than one condition class.

7.1 Site Tree Selection

Select at least one site tree for each accessible forest land condition class where no previous site tree data exist. The absence of site tree data may occur because:

- This is the first visit to the site
- On the previous visit no suitable site tree could be found for the condition
- Since the last visit there has been a change in condition class that renders the previous data incompatible with the current conditions

If a site tree is needed; select tree from a species common to the condition class being sampled, based on the criteria listed below. Select trees off the subplot where possible. Use only trees that have remained in a dominant or co-dominant crown position throughout their entire life span. If possible, trees should be 5.0 inches in diameter, or larger, and at least 20 years old. Trees that are visibly damaged, trees with ring patterns that exhibit signs of suppression, and trees with rotten cores should be rejected. If there are no acceptable site trees, record that in the plot notes and leave this section blank.

7.2 Site Tree Data Variables

7.2.1 CONDITION CLASS LIST

List all CONDITION CLASSES that the site index data from this tree represent.

Values: 1000 to 9876

7.2.2 SPECIES

Use the same procedures described in Section 5.8. Ideally, site trees in the eastern U.S. should be between 20-70 years old. If preferred trees cannot be found in this age range, expand the age range to 15-120 years. Reject trees outside the 15-120 year age range, trees that exhibit signs of damage, trees with ring patterns that show signs of suppression, trees less than 5.0 inches DBH, trees with abnormalities at DBH, and trees with rotten cores. A list of preferred site-tree species is provided. Site trees should be selected in the following order of preference:

- 1st Choice: representative of the stand, on the list for your region.
- 2nd Choice: representative of the stand, on the list for an adjoining eastern region.
- 3rd Choice: not representative of the stand, on the list for your region.
- 4th Choice: not representative of the stand, on the list for an adjoining eastern region.

Ideally, site trees in the western U.S. should be between 35-80 years old. If preferred trees cannot be found in this age range, expand the age range to 15-250 years. Reject trees outside the 15-250 year age range, trees that exhibit signs of damage, trees with ring patterns that show signs of suppression, trees less than 5.0 inches DBH, trees with abnormalities at DBH, trees with rotten cores, and woodland species. A list of preferred site-tree species is provided. Site trees should be selected in the following order of preference:

- 1st Choice: representative of the stand, on the list for your region.
- 2nd Choice: representative of the stand, on the list for an adjoining western region.
- 3rd Choice: not representative of the stand, on the list for your region.
- 4th Choice: not representative of the stand, on the list for an adjoining western region.

Values:

Eastern U.S. Site-Tree Species: NE = Northeast, NC = North Central, SO = Southern

Code	Common Name	Region
	---------- Softwood Species ----------	
0012	balsam fir	NE, NC
0043	Atlantic white-cedar	NE
0068	eastern redcedar	NE, NC
0070	larch (introduced)	NE
0071	tamarack (native)	NE, NC
0094	white spruce	NE, NC
0095	black spruce	NE, NC
0097	red spruce	NE
0105	jack pine	NE, NC
0107	sand pine	SO
0110	shortleaf pine	NE, NC, SO
0111	slash pine	SO
0121	longleaf pine	SO
0122	Ponderosa pine	NC
0125	red pine	NE, NC
0128	pond pine	NE, SO
0129	eastern white pine	NE, NC, SO
0130	Scotch pine	NE, NC
0131	loblolly pine	NE, SO
0132	Virginia pine	NE, SO
0241	northern white cedar	NE, NC
0261	eastern hemlock	NE, NC
	---------- Hardwood Species ----------	
0316	red maple	NE, NC
0317	silver maple	NE, NC
0318	sugar maple	NE, NC
0371	yellow birch	NE, NC
0375	paper birch	NE, NC
0402	bitternut hickory	NE, NC
0403	pignut hickory	NC
0404	pecan	NC
0405	shellbark hickory	NC
0407	shagbark hickory	NE, NC
0408	black hickory	NC
0409	mockernut hickory	NC
0462	hackberry	NC
0531	American beech	NE, NC
0541	white ash	NE, NC
0543	black ash	NE, NC
0544	green ash	NE, NC

Eastern U.S. Site-Tree Species: NE = Northeast, NC = North Central, SO = Southern

Code	Common Name	Region
0602	black walnut	NC
0611	sweetgum	NE, NC, SO
0621	yellow-poplar	NE, NC, SO
0741	balsam poplar	NC
0742	eastern cottonwood	NE, NC, SO
0743	bigtooth aspen	NE, NC
0746	quaking aspen	NE, NC
0762	black cherry	NC
0802	white oak	NE, NC, SO
0806	scarlet oak	NE, NC, SO
0809	northern pin oak	NC
0812	southern red oak	NE, SO
0813	cherrybark oak	NE, SO
0817	shingle oak	NE, NC, SO
0823	bur oak	NC
0826	chinkapin oak	NC
0827	water oak	NE, SO
0830	pin oak	NE, NC, SO
0832	chestnut oak	NE, SO
0833	northern red oak	NE, NC, SO
0835	post oak	NE, NC, SO
0837	black oak	NE, NC, SO
0901	black locust	NE, NC
0951	American basswood	NE, NC
0972	American elm	NE, NC
0975	slippery elm	NC
0977	rock elm	NC

Western U.S. Site-Tree Species: PNW = Pacific Northwest FIA, RMRS = Rocky Mountain FIA

Code	Common Name	Region
	---------- Softwood Species	**----------**
0011	Pacific silver fir	PNW
0015	white fir	RMRS, PNW
0017	grand fir	RMRS, PNW
0018	corkbark fir	RMRS
0019	subalpine fir	RMRS, PNW
0020	California red fir	RMRS, PNW
0021	shasta red fir	PNW
0022	noble fir	PNW
0042	Alaska yellow-cedar	PNW
0068	eastern red cedar	RMRS
0073	western larch	RMRS, PNW
0081	incense-cedar	RMRS, PNW
0093	Engelmann spruce	RMRS, PNW
0094	white spruce	RMRS, PNW
0095	black spruce	PNW
0096	blue spruce	RMRS
0098	sitka spruce	PNW
0101	whitebark pine	RMRS, PNW
0104	foxtail pine	RMRS
0108	lodgepole pine	RMRS, PNW
0109	Coulter pine	PNW
0112	Apache pine	RMRS

Western U.S. Site-Tree Species: PNW = Pacific Northwest FIA, RMRS = Rocky Mountain FIA

Code	Common Name	Region
0116	Jeffrey pine	RMRS, PNW
0117	sugar pine	RMRS, PNW
0119	western white pine	RMRS, PNW
0120	bishop pine	PNW
0122	ponderosa pine	RMRS, PNW
0135	Arizona pine	RMRS
0201	bigcone Douglas-fir	PNW
0202	Douglas-fir	RMRS, PNW
0211	redwood	PNW
0231	Pacific yew	RMRS, PNW
0242	western redcedar	RMRS, PNW
0263	western hemlock	RMRS, PNW
0264	mountain hemlock	RMRS, PNW
	---------- Hardwood Species ----------	
0312	bigleaf maple	PNW
0351	red alder	RMRS, PNW
0375	paper birch	RMRS, PNW
0462	hackberry	RMRS
0544	green ash	RMRS
0741	balsam poplar	RMRS, PNW
0742	eastern cottonwood	RMRS
0745	plains cottonwood	RMRS
0746	quaking aspen	RMRS, PNW
0747	black cottonwood	RMRS, PNW
0748	Fremont poplar/cottonwood	RMRS
0749	narrowleaf cottonwood	RMRS
0972	American elm	RMRS

7.2.3 DIAMETER

Use the same procedures described in Section 5.9.

Values: 001.0 to 999.9

7.2.4 SITE TREE LENGTH

With a clinometer or other approved instrument, measure the total length of the site tree from the ground to the top of the tree. Record to the nearest 1.0 foot. SITE TREE LENGTH must be measured; no estimates are permitted on site trees.

Values: 005 to 999

7.2.5 TREE AGE AT DIAMETER

Record the tree age as determined by an increment sample. Bore the tree at the point of diameter measurement (DBH) with an increment borer. Count the rings between the outside edge of the core and the pith. Do not add years to get total age.

Values: 001 to 999

7.2.6 SITE TREE NOTES

Record notes pertaining to an individual site tree.

Values: English language words, phrases and numbers

7.2.7 SUBPLOT NUMBER (CORE OPTIONAL)

Record the subplot number to which the site tree is referenced.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

7.2.8 AZIMUTH (CORE OPTIONAL)

Record the AZIMUTH from the subplot center; sight the center of the base of each tree with a compass. Record AZIMUTH to the nearest degree. Use 360 for north.

Values: 001 to 360

7.2.9 HORIZONTAL DISTANCE (CORE OPTIONAL)

Record the measured HORIZONTAL DISTANCE, to the nearest 0.1 foot, from the subplot center to the pith of the tree at the base.

Values: 0001 to 2000

8.0 PHASE 2 (P2) VEGETATION PROFILE (CORE OPTIONAL)

The Phase 2 (P2) Vegetation data are collected to describe vegetation structure and dominant species composition for vascular plants. The data collected provide a horizontal and vertical estimation of vegetation located within the sample area and provide information about the most abundant species found on the subplot. Information on the abundance, structure, and species composition of understory plant communities has many uses. It can be used to assess wildlife habitat, biomass, forage availability, grazing potential, vegetation competition with tree growth, fuel loadings from understory vegetation, and potential site productivity. The most abundant species provide information to describe plant communities and to predict associated forest stand characteristics. Accurately representing the species present on a site and monitoring their change in abundance in response to forest development, disturbance, or management is therefore important to a wide variety of users. This information is also used to augment forest ecosystem health assessments from P3 plots, in terms of vegetation structure and rates of change of community vascular plant composition.

The P2 Vegetation protocols are core-optional. Each FIA unit determines whether to collect the P2 Vegetation information, and several levels of options must be determined by each unit prior to data collection. Options declared prior to field data collection include P2 VEGETATION SAMPLING STATUS and LEVEL OF DETAIL. P2 VEGETATION SAMPLING STATUS determines if P2 Vegetation is to be collected, and, if so, what lands are included; the unit may choose to collect only on accessible forested conditions or on all accessible conditions found on the plot. The LEVEL OF DETAIL determines if data are collected on structure by growth habit only; or if the most abundant species are also recorded; and whether tally tree species greater than or equal to 5 inches DBH (DRC for woodland species) are included in species records. FIA units collecting species data record information on (up to) the four most abundant species per SPECIES GROWTH HABIT per subplot. The four most abundant species must each have a total aerial canopy cover of at least 3 percent on the subplot and within the SPECIES GROWTH HABIT to be recorded. Most tally tree species greater than or equal to 5 inches DBH/DRC are already measured during tree tally, but some units may choose to also record visual estimates of canopy cover for them. Regardless of the LEVEL OF DETAIL, the protocols for the P2 Vegetation Profile will be implemented in such a way that basic structure and species data can be compared across the nation.

8.1 Vegetation Sampling Design

The core optional P2 Vegetation Profile includes measurements of *Vegetation Structure* (8.4) – canopy cover by layer and total aerial canopy cover of each growth habit – with additional options to collect *Species Composition* (8.5) data on the (up to) 4 most abundant species in each SPECIES GROWTH HABIT.

P2 Vegetation is sampled on accessible condition classes within the 24.0-foot radius subplot. Inventory units implementing the P2 Vegetation Profile determine if they will include accessible forestland conditions, or any accessible land conditions (P2 VEGETATION SAMPLING STATUS). If the area of an accessible condition class is less than 100 percent on a subplot, P2 Vegetation measurements are recorded only on the portion that is in the accessible condition class(es). If multiple accessible condition classes are present on the subplot, separate estimates are made for each accessible condition class on the subplot. Prior to implementation, inventory units must also determine the LEVEL of DETAIL they will collect, so that regional field guides and PDR programs can be customized to ensure quality data is collected in the most efficient manner possible. All units implementing the P2 Vegetation Profile will collect LEVEL OF DETAIL = 1, *Vegetation Structure*. LEVEL OF DETAIL = 2 and 3 are optional and include *Species Composition* data.

The P2 Vegetation Profile is best recorded when all plant species are fully leafed out. However, crews may end up visiting plots early in the season before leaves are fully expanded or late in the season when plants are beginning to senesce. Notes can be added to subplot records indicating unusual phenological

conditions. Crews should not collect P2 Vegetation data when snow covers the subplot (see 1.22.1 P2 VEG SUBPLOT SAMPLE STATUS).

8.2 General definitions

Canopy Cover – Canopy cover is defined as the area of ground surface covered by a vertical projection of the canopy of a vascular plant. The canopy is described by a polygon surrounding the outer edges of the foliage (fig. 55), without subtracting any normal spaces occurring between the leaves of plants (Daubenmire 1959[1]). Overlapping crowns are not double-counted (visualize the canopy cover collapsed into a 2-dimensional space); the maximum possible canopy cover is the percentage of the subplot area within the accessible condition.

All canopy cover estimates are focused on foliage within the sampled accessible condition class(es) within the subplot perimeter (24.0-foot radius, horizontal distance). Canopy cover is estimated for each sampled accessible condition of the subplot. If multiple sampled accessible conditions occur on a subplot, treat the condition boundary as a vertical wall on the plot: **plant foliage is included in the condition it is hanging over**, even if the plant is rooted in a different condition. However, the canopy **cover value is always estimated as a percentage of an entire subplot**. That is, if the canopy cover within the accessible condition is about equal to a circle with a radius of 5.3 feet, the canopy cover estimate will always be 5 percent, even if only 30 percent of the subplot is in the accessible condition on which the canopy cover is being measured.

Canopy cover is collected by height layer and as a total (aerial view) across all layers for each growth habit in *Vegetation Structure* (8.4). For each layer, examine the canopy cover of each Structure Growth Habit as if the other growth habits and other layers do not exist. If a Structure Growth Habit does not have foliage in a layer, enter 0 (do not count tree boles as cover). For total aerial canopy cover by Structure Growth Habit, examine each growth habit individually as if the other growth habits do not exist. Total aerial canopy cover is collected for each most abundant species in *Species Composition* (8.5); examine each species individually, as if the other species do not exist**.**

Canopy cover is estimated to the nearest 1 percent. For *Vegetation Structure* assessments, canopy cover >0 and ≤1 percent is coded as 1 percent (i.e., trace amounts are coded as 1%). For *Species Composition* assessments, a species must have at least 3 percent total aerial canopy cover (i.e., do not round total aerial canopy cover <3% up to 3%).

Canopy cover is vertically projected from the outline of the foliage **at the time of plot visit.** All foliage that is or was alive during the current growing season is included in the cover estimates. Canopy cover from broken tops and stems is included, unless completely detached. Do not ocularly upright leaning trees.

See tabulation below for canopy cover to area relationships for a 1/24 acre subplot and figure 55 for additional visual calibrations.

Cover	Area (ft^2)	Square length on side (ft)	Circle radius (ft)
1%	18	4.3	2.4
3%	54	7.4	4.2
5%	90	9.5	5.4
10%	181	13.4	7.6
15%	271	16.5	9.3
20%	362	19.0	10.7
25%	452	21.3	12.0
50%	905	30.1	17.0

[1] Daubenmire. R. 1959. A canopy-coverage method of vegetational analysis. Northwest Science 33(1): 43-64.

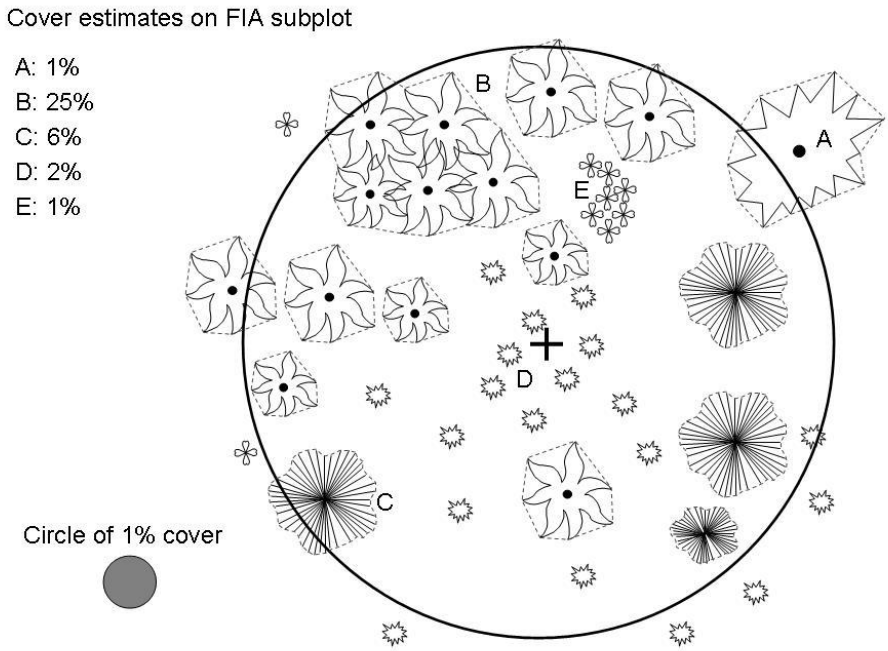


Figure 55. Assessing canopy cover.

Growth Habits – P2 Vegetation data are collected by growth habits at each LEVEL OF DETAIL. In general, growth habits for vascular plants include trees, shrubs/subshrubs/woody vines, forbs, and graminoids.

However, depending on the LEVEL OF DETAIL, **trees** are grouped in different ways. *Vegetation Structure* (8.4) tree Structure Growth Habits are determined only including tree species that are listed in Appendix 3, after taking into account the three exclusion zones (see variable 5.8 SPECIES); *Species Composition* (8.6) tree SPECIES GROWTH HABITs are determined by DBH/DRC. See sections 8.4 and 8.5 for more detail.

Layer Codes – Structure Growth Habits are assessed by layers in *Vegetation Structure* (8.4), and one of the following layer codes will be assigned to individual plant species' SPECIES GROWTH HABITs in *Species Composition* (8.5). Measure the layer height from ground level; see figure 56 for examples of measuring layer heights on sloping and uneven ground.

Layer 1	0 to 2.0 feet
Layer 2	2.1 to 6.0 feet
Layer 3	6.1 to 16.0 feet
Layer 4	Greater than 16 feet

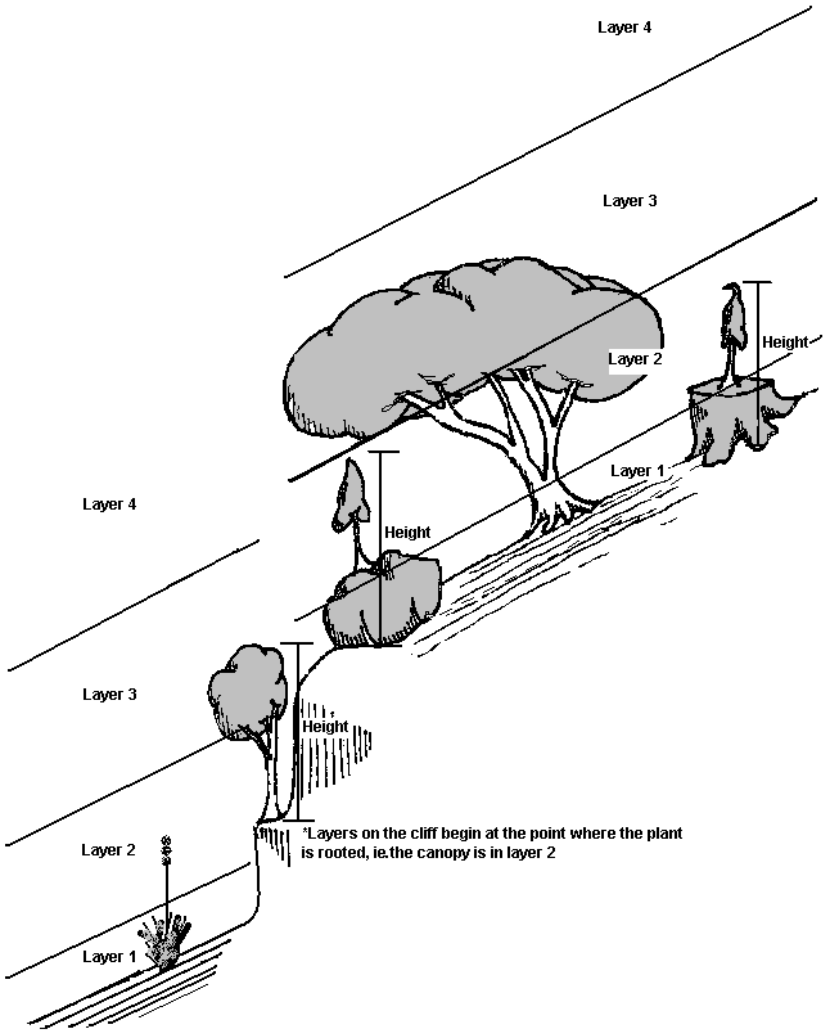


Figure 56. To determine the layer of a plant, measure the height of the layer from the ground.

NRCS PLANTS database – The Natural Resource Conservation Service (NRCS) PLANTS Database provides standardized information about the vascular plants, mosses, liverworts, hornworts, and lichens of the U.S. and its territories. It includes names, plant symbols, checklists, distributional data, species abstracts, characteristics (including growth habits), images, crop information, automated tools, onward Web links, and references:

USDA, NRCS. 2017. The PLANTS Database (http://plants.usda.gov, September 15, 2017). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

FIA currently uses a stable code set downloaded September 15, 2017.

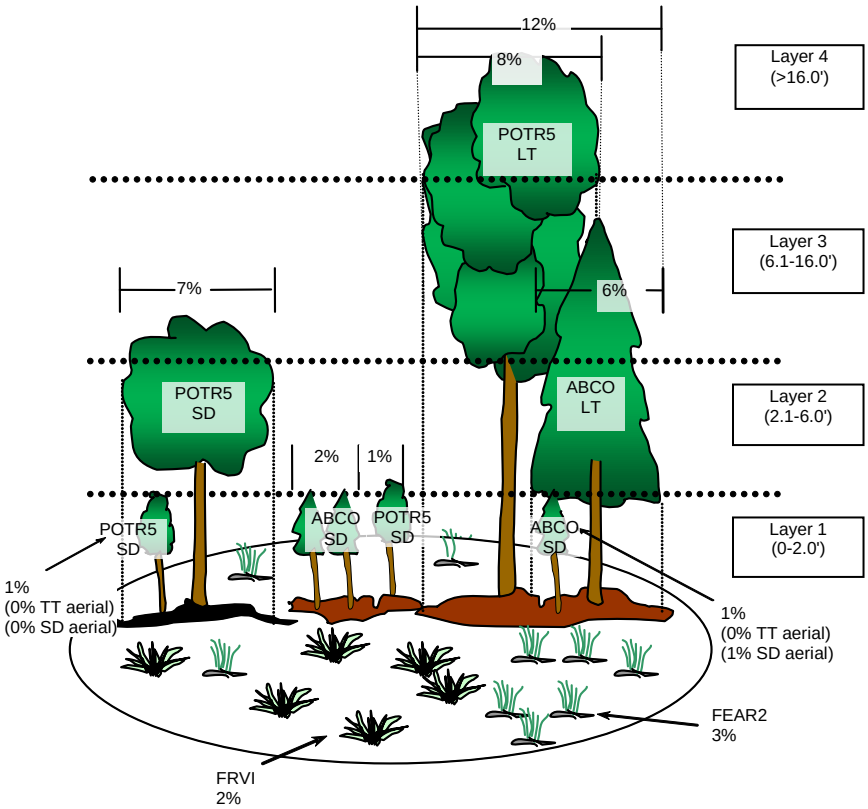


Figure 57. Example of growth habit by layer and species composition.

Table 1-Estimation of canopy cover by layer and aerial view of each Structure Growth Habit in figure 57

Vegetation Structure Growth Habit	Layer 1 (0-2.0 ft)	Layer 2 (2.1-6.0 ft)	Layer 3 (6.1-16.0 ft)	Layer 4 (>16.0 ft)	Aerial
			Percent canopy cover		
Tally tree sp (TT)	005	013	019	008	022
Non-tally tree sp (NT)	000	000	000	000	000
Shrub/Subshrub/Woody Vine (SH)	000	000	000	000	000
Forb (FB)	002	000	000	000	002
Graminoid (GR)	003	000	000	000	003

Table 2-Estimation of total aerial canopy cover by species in figure 57

Level of Detail	Species Growth Habit	Species Code	Cover	Layer
2	GR	FEAR2	003	1
2	SD	ABCO	003	1
2	SD	POTR5	008	3
3	LT	POTR5	008	4
3	LT	ABCO	006	2

Note: FRVI, estimated at 2%, was not recorded, and ABCO and POTR5 are present as two different SPECIES GROWTH HABITs (seedling/sapling and large tree) with at least 3% total aerial canopy cover within the SPECIES GROWTH HABIT on the subplot.

8.3 Vegetation Data Collection Location – Subplot-Level Variables

8.3.1 SUBPLOT NUMBER

Record the code corresponding to the number of the subplot.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

8.3.2 CONDITION CLASS NUMBER

Record the number for the sampled accessible condition class in which the vegetation is found. If multiple sampled accessible conditions occur on the same subplot, data will be collected for each accessible condition separately.

Values: 1 to 9

8.4 Vegetation Structure

In this section, use ocular methods to estimate canopy cover by layer and aerial view cover for each Structure Growth Habit, and record to the nearest percent (canopy cover >0 and <1% is coded as 1%; i.e., trace amounts are coded as 1%.)

Canopy cover by layer:
Estimate the canopy cover in each Structure Growth Habit for each of the four layers. Include Structure Growth Habits with foliage present on the accessible condition and with foliage overhanging the accessible condition. For each layer canopy cover, examine the canopy cover of each Structure Growth Habit as if the other growth habits and other layers do not exist. Do not double-count overlapping crowns within a Structure Growth Habit; visualize the canopy cover within the layer collapsed into a 2-dimensional space. If a Structure Growth Habit does not have foliage in a layer, enter 0 (do not count tree boles as cover).

Aerial View Coverage:
Determine the total aerial canopy cover by Structure Growth Habit. .Examine each Structure Growth Habit individually as if the other growth habits do not exist. Do not double-count overlapping crowns within a Structure Growth Habit (maximum cover = the percentage of the subplot area in the accessible condition.)

The total aerial canopy cover for a Structure Growth Habit must be equal to or greater than the highest canopy cover recorded for an individual layer in that growth habit, but cannot be greater than the sum of the canopy covers recorded for all the layers in that growth habit.

Vegetation Structure Growth Habits:
Apply the definitions that follow based on the species and appearance of the plants **on the subplot-condition** (i.e., do not put the same species in multiple Structure Growth Habits on the same subplot-condition.) If a tree species has been selected as a tally tree species by the particular FIA unit, always record that species in the 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 should be recorded as non-tally tree species (NT). If the growth habit is shrub in

another environment, record that species as a shrub (SH). The definitions (adapted from NRCS PLANTS) are:

TT **Tally Tree Species (TT):** Only include tree species that are listed in Appendix 3, after taking into account the three exclusion zones (see variable 5.8 SPECIES). Any plant of that species is included, regardless of its shape and regardless of whether it was tallied on the subplot or microplot during tree tally. Seedlings (any length, no minimum), saplings, and mature plants are included.

NT **Non-tally Tree Species (NT):** 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.

SH **Shrubs/Subshrubs/Woody Vines (SH):** Woody, multiple-stemmed plants of any size, subshrubs (low-growing shrubs under 1.5 feet tall at maturity), and woody vines. Most cacti are included in this category.

FB **Forbs (FB):** Herbaceous, broad-leaved plants; includes non-woody-vines, ferns (does not include mosses and cryptobiotic crusts).

GR **Graminoids (GR):** Grasses and grass-like plants (includes rushes and sedges).

8.4.1 TALLY TREE SPECIES COVER LAYER 1

Record canopy cover for all tally tree species in layer 1 (0-2.0 feet) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC.

Values: 000-100

8.4.2 TALLY TREE SPECIES COVER LAYER 2

Record canopy cover for all tally tree species in layer 2 (2.1- 6.0 feet) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1.

8.4.3 TALLY TREE SPECIES COVER LAYER 3

Record canopy cover for all tally tree species in layer 3 (6.1- 16.0 feet) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1.

8.4.4 TALLY TREE SPECIES COVER LAYER 4

Record canopy cover for all tally tree species in layer 4 (16.1 feet and above) to the nearest percent. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1.

8.4.5 TALLY TREE SPECIES COVER – AERIAL VIEW

Record the total aerial canopy cover for all tally tree species over all layers. Canopy cover includes all tally tree species present, regardless of DBH or DRC. Follow the same procedures as for TALLY TREE SPECIES COVER LAYER 1, but include all layers.

8.4.6 NON-TALLY TREE SPECIES COVER LAYER 1

Record canopy cover for species **not** on the tally tree species list with tree growth habit in layer 1 (0-2.0 feet) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC.

Values: 000-100

8.4.7 NON-TALLY TREE SPECIES COVER LAYER 2

Record canopy cover for species **not** on the tally tree species list with tree growth form in layer 2 (2.1- 6.0 feet) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1.

8.4.8 NON-TALLY TREE SPECIES COVER LAYER 3

Record canopy cover for species **not** on the tally tree species list with tree growth form in layer 3 (6.1- 16.0 feet) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1.

8.4.9 NON-TALLY TREE SPECIES COVER LAYER 4

Record canopy cover for species **not** on the tally tree species list with tree growth habit in layer 4 (16.1 feet and above) to the nearest percent. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1.

8.4.10 NON-TALLY TREE SPECIES COVER – AERIAL VIEW

Record the total aerial canopy cover for species **not** on the tally tree species list with tree growth habit over all layers. Canopy cover includes all non-tally tree species present, regardless of DBH or DRC. Follow the same procedures as for NON-TALLY TREE SPECIES COVER LAYER 1, but include all layers.

8.4.11 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1

Record canopy cover for shrubs/subshrubs/woody vines in layer 1 (0-2.0 feet) to the nearest percent.

Values: 000-100

8.4.12 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 2

Record canopy cover for shrubs/subshrubs/woody vines in layer 2 (2.1-6.0 feet) to the nearest percent. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1.

8.4.13 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 3

Record canopy cover for shrubs/subshrubs/woody vines in layer 3 (6.1-16.0 feet) to the nearest percent. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1.

8.4.14 SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 4

Record canopy cover for shrubs/subshrubs/woody vines in layer 4 (16.1 feet and above) to the nearest percent. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1.

8.4.15 SHRUB, SUBSHRUB, AND WOODY VINE COVER—AERIAL VIEW

Record the total aerial canopy cover for the shrub/subshrub/woody vine growth habit over all layers. Follow the same procedures as for SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1, but include all layers.

8.4.16 FORB COVER LAYER 1

Record canopy cover for forbs in layer 1 (0-2.0 feet) to the nearest percent.

Values: 000-100

8.4.17 FORB COVER LAYER 2

Record canopy cover for forbs in layer 2 (2.1-6.0 feet) to the nearest percent. Follow the same procedures as for FORB COVER LAYER 1.

8.4.18 FORB COVER LAYER 3

Record canopy cover for forbs in layer 3 (6.1-16.0 feet) to the nearest percent. Follow the same procedures as for FORB COVER LAYER 1.

8.4.19 FORB COVER LAYER 4

Record canopy cover for forbs in layer 4 (16.1 feet and above) to the nearest percent. Follow the same procedures as for FORB COVER LAYER 1.

8.4.20 FORB COVER—AERIAL VIEW

Record the total aerial canopy cover for the forb growth habit over all layers. Follow the same procedures as for FORB COVER LAYER 1, but include all layers.

8.4.21 GRAMINOID COVER LAYER 1

Record canopy cover for graminoids in layer 1 (0-2.0 feet) to the nearest percent.

Values: 000-100

8.4.22 GRAMINOID COVER LAYER 2

Record canopy cover for graminoids in layer 2 (2.1-6.0 feet) to the nearest percent. Follow the same procedures as for GRAMINOID COVER LAYER 1.

8.4.23 GRAMINOID COVER LAYER 3

Record canopy cover for graminoids in layer 3 (6.1-16.0 feet) to the nearest percent. Follow the same procedures as for GRAMINOID COVER LAYER 1.

8.4.24 GRAMINOID COVER LAYER 4

Record canopy cover for graminoids in layer 4 (16.1 feet and above) to the nearest percent. Follow the same procedures as for GRAMINOID COVER LAYER 1.

8.4.25 GRAMINOID COVER—AERIAL VIEW

Record the total aerial canopy cover for the graminoid growth habit over all layers. Follow the same procedures as for GRAMINOID COVER LAYER 1, but include all layers.

8.5 Species Composition

Species are recorded when LEVEL OF DETAIL = 2 or 3. Identify the (up to) four most abundant species within each SPECIES GROWTH HABIT (tree seedlings and saplings, shrubs/subshrubs/woody vines, forbs, graminoids, and large trees) that occupy 3 percent or greater total aerial canopy cover on the subplot and within the SPECIES GROWTH HABIT (do not round total aerial canopy cover <3% up to 3%.) Although up to four species per SPECIES GROWTH HABIT can be recorded, crews should not spend more than 5 minutes searching for additional species when less than four species are not readily observable. The methods described assume that only one field crew member per plot is entering P2 Vegetation Profile data.

When there are multiple accessible conditions within a subplot, the species must be present at 3 percent or more total aerial canopy cover on the full 24-foot radius subplot and within the SPECIES GROWTH HABIT in order to be recorded. If part of the subplot is a non-sampled condition (e.g., nonforest condition, not sampled for P2 Vegetation because 8.3.1 P2 VEGETATION SAMPLING STATUS = 1; or inaccessible condition, not sampled because 2.1.1 CONDITION CLASS STATUS = 5), estimate total aerial canopy cover for the full subplot if possible; otherwise assume the species canopy cover is the same on the non-sampled portion. If a species is present at 3 percent total aerial canopy cover or more on the full subplot and within the SPECIES GROWTH HABIT, record SPECIES GROWTH HABIT, SPECIES CANOPY COVER, and SPECIES VEGETATION LAYER separately for each accessible condition,. SPECIES CANOPY COVER values less than 3 percent for an accessible condition are valid as long as the total aerial canopy cover of the species on the full subplot and within the SPECIES GROWTH HABIT is at least 3 percent. See figure 58 for an example of species total aerial canopy cover estimation. See figure 59 for a *Species Composition* subplot flow.

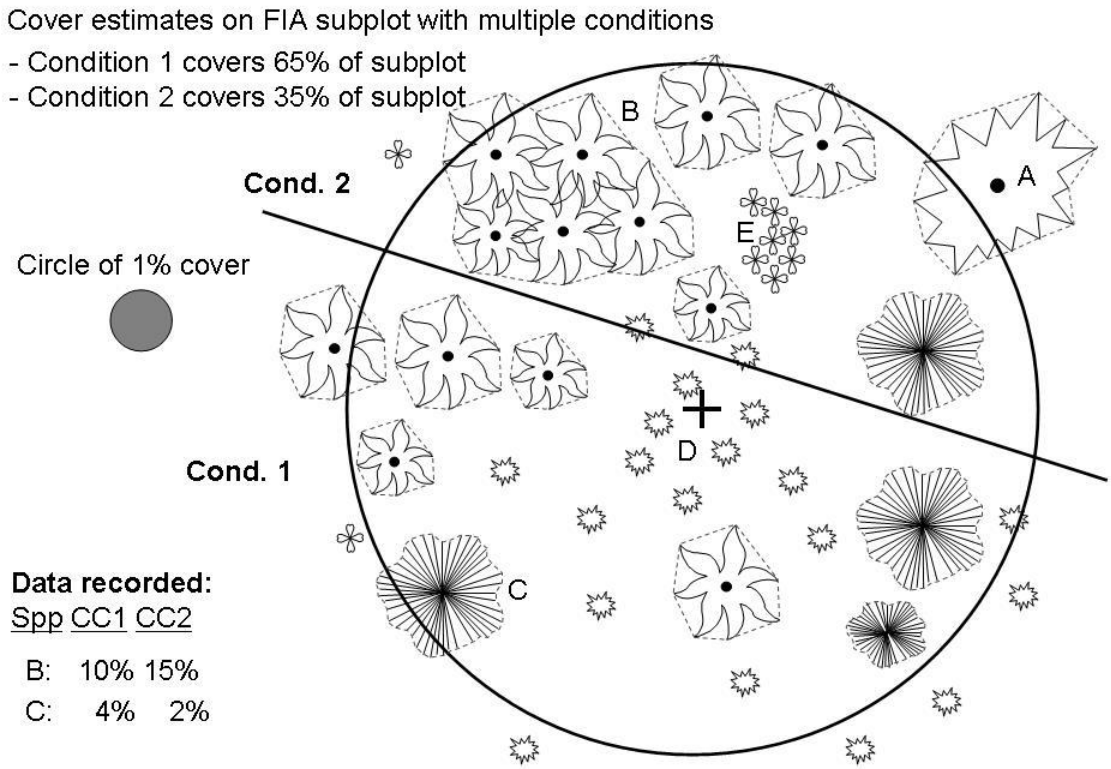


Figure 58. Example of species total aerial canopy cover estimation on a subplot with 2 accessible conditions. See figure 55 for total aerial canopy cover across the subplot. In figure 55, species A, D, and E would be included in estimates of *Vegetation Structure* by Structure Growth Habit, but not recorded for *Species Composition*. Note that species with subplot total aerial canopy cover <3% are not recorded, but that SPECIES CANOPY COVER recorded on an accessible condition can be less than 3%.

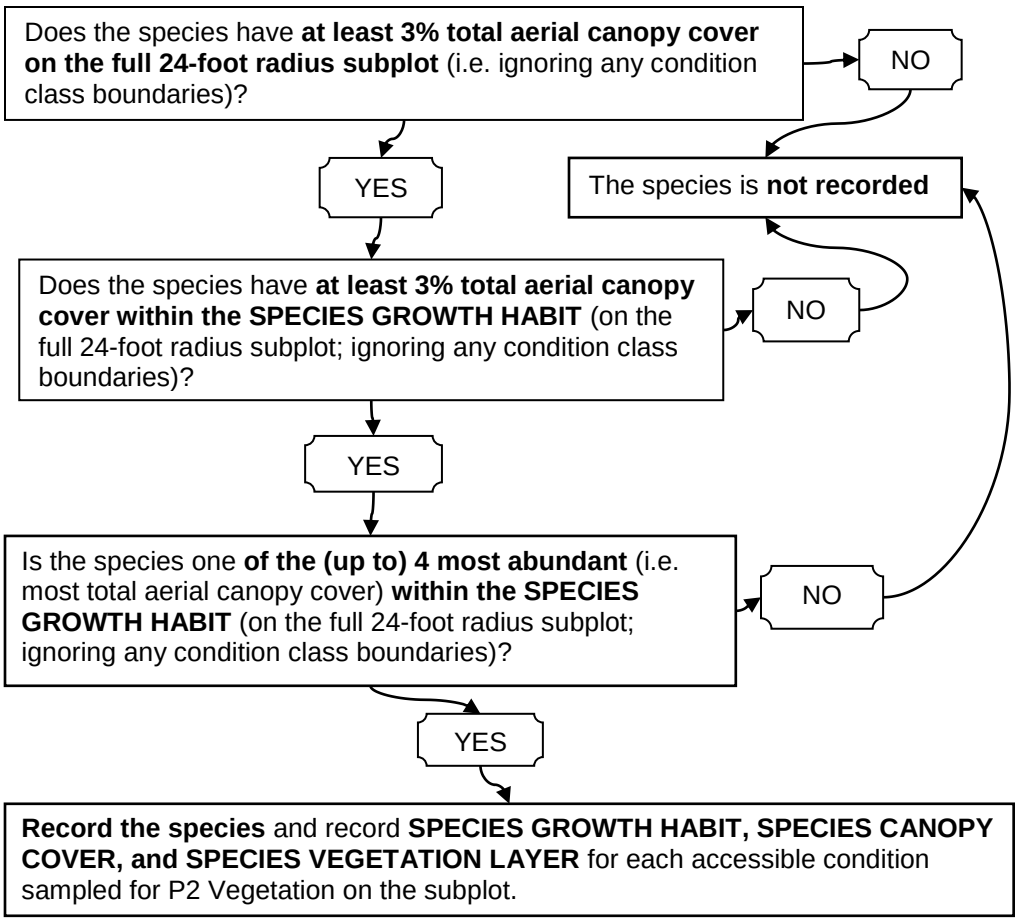


Figure 59. *Species Composition* subplot flow chart.

8.5.1 SPECIES GROWTH HABIT

Record the growth habit of the species. Because many species can exhibit more than one growth habit, it is important to note which growth habit each recorded species is demonstrating on each accessible condition in a subplot (subplot-condition).

Tally tree species[2] are always recorded as seedling/sapling (SD) and/or large tree (LT) SPECIES GROWTH HABITs, even when they exhibit a shrub-like growth habit in some environments.

Non-tally tree species[3] are recorded as seedling/sapling (SD) and/or large tree (LT) SPECIES GROWTH HABITs when they exhibit a tree-like growth habit; and are recorded as shrub (SH) SPECIES GROWTH HABIT when they exhibit a shrub-like growth habit.

A species may be recorded with a different SPECIES GROWTH HABIT on a different subplot-condition on the same subplot. If a species has more than one growth habit on an accessible condition in a subplot, record the one SPECIES GROWTH HABIT that is most prevalent within the subplot-condition (except for tally and non-tally tree species).

[2]Only include tree species that are listed in Appendix 3, after taking into account the three exclusion zones (see variable 5.8 SPECIES)
[3] Tree species not on a particular FIA unit's tree tally list that are woody plants with a single well-defined dominant stem, not supported by other vegetation or structures (not vines), and which are, or are expected to become, greater than 13 feet in height.

For tally and non-tally tree species, both tree SPECIES GROWTH HABITs (SD and LT) are coded for the same species within the subplot-condition the species has a total aerial canopy cover of at least 3% in each SPECIES GROWTH HABIT.

Values:

Value	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 SPECIES GROWTH HABIT.
SH	Shrubs/Subshrubs/Woody Vines: Woody, multiple-stemmed plants of any size, subshrubs (low-growing shrubs under 1.5 feet tall at maturity), and 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 SPECIES GROWTH HABIT.
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 SPECIES GROWTH HABIT.
GR	Graminoids: Grasses and grass-like plants (includes rushes and sedges). Up to four species are recorded if individual species total aerial canopy cover is at least 3% on the subplot and within the SPECIES GROWTH HABIT
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). For LEVEL OF DETAIL = 2,include only non-tally tree species; for LEVEL OF DETAIL = 3, include tally and non-tally tree species. Up to four species of large trees (DBH or DRC at least 5 inches) are recorded if individual species aerial canopy cover is at least 3% on the subplot and within the SPECIES GROWTH HABIT.

8.5.2 SPECIES CODE

Record a code for each most abundant (see section 8.5) vascular plant species. Species codes must be the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database (currently January 2010 version). Identification to species only is expected. However, if subspecies information is known, enter the appropriate NRCS code. For graminoids, genus and unknown codes are acceptable, but do not lump species of the same genera or unknown code. For example, if several unknown CAREX species are present, only record the individual most abundant species.

If a plant cannot be identified quickly and confidently, assign a NRCS PLANTS genus or unknown code appropriate to the species. Collect a specimen away from the subplot unless the species is locally sparse or another SPECIMEN NOT COLLECTED REASON CODE (8.5.8) applies. A species is “locally sparse” if 5 or fewer plants are present in the entire plot (4 subplots) and immediate surrounding area. A species may be sparse and still meet the criteria for inclusion in species composition, but this will be rare. See appendix 10, Unknown Specimen Collection.

Acceptable unknown codes

Code	Common Name
2FERN	Fern or Fern Ally
2FORB	Forb (herbaceous, not grass nor grasslike)
2FD	Forb, dicot
2FM	Forb, monocot
2GRAM	Graminoid (grass or grasslike)
2GA	Grass, annual
2GP	Grass, perennial
2GL	Grass-like, (sedges and rushes)
2PLANT	Plant
2SHRUB	Shrub (>0.5m)
2SUBS	Subshrub (<0.5m)
2TREE	Tree
2VH	Vine, herbaceous
2VW	Vine, woody

Values: Accepted NRCS species code when the species is known, or an accepted NRCS genus or unknown code when the species is not known

8.5.3 UNIQUE SPECIES NUMBER

When any code is entered for the first time on a plot, it is assigned UNIQUE SPECIES NUMBER = 1. If more than one unidentified species is discovered that is described by the same genus or unknown code, the next sequential number is assigned. If a recorded unidentified species is encountered again elsewhere on the plot, the field crew records the species with the same genus or unknown code with the same unique species number.

Values: 1-99, assigned in sequential numbers

8.5.4 SPECIES CANOPY COVER

For each species recorded, estimate and record the total aerial canopy cover present on the subplot-condition to the nearest 1 percent. Examine each species individually as if the other species do not exist. When recording SPECIES CANOPY COVER for seedlings and saplings (SPECIES GROWTH HABIT = SD), do not include any canopy cover from trees greater than or equal to 5 inches DBH (DRC for woodland species), regardless of how close to the ground the canopy cover extends A separate estimate is made for the SPECIES CANOPY COVER of trees greater than or equal to 5 inches DBH/DRC (SPECIES GROWTH HABIT = LT).

Values: 001-100

8.5.5 SPECIES VEGETATION LAYER

For each individual species recorded, assign one of the vegetation layers. These layers illustrate the vertical diversity of the most abundant species found on the subplot.

Assign each plant species record to only one of the vegetation layers per SPECIES GROWTH HABIT per subplot-condition. If a plant species is found in more than one layer, assign the species to the layer where most of the canopy cover occurs. If a species occupies multiple layers equally, assign the highest of the equally occupied layers. If a plant has a seed head that grows

much taller than the rest of the plant, record the layer that the main part of the plant is in, not the top of the seed head.

Values:

Value	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

8.5.6 SPECIMEN OFFICIALLY COLLECTED

Record a code to indicate whether or not a specimen was collected for each species, genus or unknown code entered as a new unique species.

Values:

Value	Description
0	No, a specimen was not collected
1	Yes, a specimen was collected

8.5.7 SPECIMEN LABEL NUMBER

Record the label number for the collected specimen. Pre-numbered labels are provided to each crew by the regional coordinator or auto-generated with the data collection software.

Values: 1 to 99999, as pre-printed and assigned by region or auto-generated in the PDR

8.5.8 P2 SPECIMEN NOT COLLECTED REASON CODE

Record the code that describes why a specimen has not been collected.

Values:

Value	Description
01	Species is locally sparse (fewer than 5 individual plants in area of the plot)
02	Species has no mature foliage or reproductive parts present, so is unlikely to be identifiable if collected.
03	Hazardous situation
04	Time limitation
05	Wilderness or reserved land where plant collections are not allowed
06	Specimen collected for immediate/local identification
07	Not required by inventory unit
10	Other (explain in notes)

8.5.9 VEGETATION SPECIES NOTES

Notes may be entered for any species encountered, but are required for each new species that is not identified. Enter text that describes the species. This text may be used in the specimen label and unknown report.

Values: English language words, phrases, and numbers

9.0 INVASIVE PLANTS

The objectives of the Phase 2 (P2) invasive plants protocol are to document abundance and monitor changes in abundance of selected species over time. Combined with other plot data and other datasets, these data can be used to predict the future spread of selected species. Invasive plant species are having tremendous economic and ecological impacts on our nation's forests, and the impacts are increasing over time. Providing accurate, statistically valid estimates of the distribution and abundance of some of the most damaging species will give managers and policy-makers a better understanding of the problem than they would otherwise have.

Each FIA unit, in collaboration with vegetation experts, has developed lists of the most important invasive species to monitor on forested lands. Depending on local needs or forest conditions, there may be different lists of species for individual states or portions of states. Changes to the species on these lists are managed by the individual FIA units using local change procedures. However, when an FIA unit samples invasive species, they will use the field protocols contained in this chapter.

Data will be collected by crew members who have been trained and certified in the Invasive plants protocol methods. These crew members are expected to have field guides that allow for unambiguous identification of the plant species on the list they are to use, and training in field identification and cover estimation of those species under different conditions.

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

9.1 Invasive species sample design

Phase 2 sampling of invasive species is most often focused on accessible forest condition classes within the 24.0-foot radius subplot. If the total area of all accessible forest land condition classes is less than 100 percent on a subplot, **invasive species measurements are done only on the portion that is in accessible forest land condition classes**. If multiple accessible forested condition classes are present on the subplot, separate estimates are made for each condition class on the subplot. Canopy cover estimates are only made for the area within accessible forest condition(s)—for example, vegetation cover over-hanging a nonforest road condition <u>is not included</u> in the estimate.

However, each FIA unit has the **option to also sample invasive species on accessible nonforest land conditions (condition status 2)**, where desired or funded by specific landowners (e.g., on some National Forests in the West). Where this is done, estimates of invasive species abundance are maintained separately on forest and nonforest conditions.

Canopy cover is estimated for any listed invasive species present on the measured condition(s) of a subplot, regardless of abundance (i.e., there is not minimum cover threshold for sampling). When crews are not sure about the identification of a plant that might be a listed invasive, they are encouraged to collect specimens for later identification (appendix 10). Rules and expectations for plant collection and identification are specified by individual FIA units.

9.2 Species Records

The invasive plant recorder does a search of each measured condition on the subplot. **Only** listed species rooted in or overhanging (and rooted out of) this condition are included. For tree species, there are no minimum (or maximum) height limits as are required for seedling counts. All foliage that is or was alive during the current growing season is included in the cover estimates (e.g., brown Canada thistle in late summer is counted, live buds on Russian olive in late fall are used to estimate canopy cover).

Total cover is estimated on measured conditions on each 24.0-foot radius subplot for every species on the invasive plant list found. If multiple conditions are being sampled on the same subplot, separate cover estimates for every species must be made.

9.3 SUBPLOT NUMBER

Record the code corresponding to the number of the subplot.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

9.4 CONDITION CLASS NUMBER

Record the number for the measured condition class in which the invasive plant(s) is found. If multiple measured conditions occur on the same subplot, data will be collected for each condition separately.

Values: 1-9

9.5 SPECIES CODE

Record the code for any species listed in your region's invasive plant species list that is found rooted in or overhanging (and rooted out of) the measured condition within the subplot. Species codes must be the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database September 15, 2017 version maintained by the FIA IM group (USDA, NRCS. 2017. The PLANTS database [http://plants.usda.gov/plants]. National Plant Data Center, Baton Rouge, LA 70874-4490).

In many of the invasive plant ID guides used by FIA units, some species are grouped together in the ID descriptions, and it may be difficult to distinguish between them with the information provided. In addition, some plants may be hybrids of listed species. Enter the code for the most likely species in the group, or the first one in the group if you are not sure.

If a species is suspected of being a listed invasive but cannot be identified quickly and confidently, and the FIA unit's protocols require specimen collection, assign a NRCS PLANTS unknown code. A subset of acceptable unknown codes that can be used is listed below. Collect a specimen unless the species is locally sparse. A species is "locally sparse" if five or fewer plants are present in the entire plot (4 subplots) and immediate surrounding area.

Unknown Code	Common Name
2FERN	Fern or Fern Ally
2FORB	Forb (herbaceous, not grass nor grasslike)
2GRAM	Graminoid (grass or grasslike)
2PLANT	Plant
2SHRUB	Shrub (>.5m)
2SUBS	Subshrub (<.5m)
2TREE	Tree
2VH	Vine, herbaceous
2VW	Vine, woody

Values: Accepted NRCS species code from the appropriate list for the unit when the species is known, or a NRCS unknown code when the species is not known.

9.6 UNIQUE SPECIES NUMBER

When any species code is entered for the first time on a plot, the UNIQUE SPECIES NUMBER assigned is “1”. If more than one unidentified species is recorded that is described by the same unknown code, the next sequential number is assigned. If a previously-recorded unidentified species is encountered again elsewhere on the plot, the UNIQUE SPECIES NUMBER that corresponds to the earlier encountered specimen must be entered. For example, an unknown thistle and unknown hawkweed would both be given a species code of “2FORB” but would need to be given different UNIQUE SPECIES NUMBERs when measured.

Values: 1-99, assigned in sequential numbers

9.7 SPECIES CANOPY COVER

A rapid canopy cover estimate, to the nearest percent cover, is made for each species for all foliage across all layer heights. **Canopy cover is based on a vertically-projected polygon described by the outline of the foliage**, ignoring any normal spaces occurring between the leaves of plants (Daubenmire 1959), and ignoring overlap among multiple layers of a species. For each species, cover can never exceed 100 percent. Cover is estimated for each measured condition on the subplot separately. However, the foliage **cover is always estimated as a percent of an entire subplot**. For example, on a subplot with two sampled conditions, a species occurs with a cover equal to a circle with a radius of 7.6 feet on the full subplot, or 10 percent cover. On condition class #1 it covers an area equal to a circle of 2.4 feet radius and is recorded as 1 percent cover. The remainder, 9 percent cover, is recorded for condition #2. If the species is only present on condition class #1 with an area equal to a circle of 2.4-feet radius it is recorded as 1 percent. The proportion of the subplot in each condition does not matter.

If cover is greater than 0 but less than 1.5 percent, record as 1 percent cover. For species of moderate cover, it may be easiest to divide the subplots into quarters, estimate canopy cover of each quarter separately, and then add them together. The following area-cover sizes may be useful in developing estimates for an entirely forested subplot:

Subplot radius = 24.0 feet, Subplot area = 1809 ft^2			
Cover	**Area (ft^2)**	**Length of a side of a square(ft)**	**Radius of circular area(ft)**
1%	18	4.3	2.4
3%	54	7.4	4.1
5%	90	9.5	5.3
10%	181	13.4	7.6
20%	362	19	10.7

Values: 001 to 100

9.8 INVASIVE SPECIMEN COLLECTED

Record a code to indicate whether or not a specimen was collected for each species genus or unknown code entered as a new unique species. If the record is an unknown code, your unit requires specimen collection, and a plant specimen is not collected, describe the reason it was not collected in 9.10, INVASIVE PLANT NOTES.

Values:

Value	Description
0	No, a specimen was not officially collected
1	Yes, a specimen was officially collected

9.9 SPECIMEN LABEL NUMBER

Record the label number for the collected specimen. Where plant specimen collection is required, numbered labels are provided to each crew.

Values: 1 to 99999, as pre-printed and assigned by FIA unit.

9.10 INVASIVE PLANT NOTES

Notes are **required** for each species record with an unknown code. Enter text that describes the species or that explains why it was not collected if collection was required but not done. This text may be used on the specimen label and any spreadsheet used to track specimens.

Values: English language words, phrases, and numbers

9.11 References

Daubenmire, R. 1959. A canopy-coverage method of vegetational analysis. Northwest Science 33(1): 43-64.

10. DOWN WOODY MATERIALS (Phase 2 – CORE OPTIONAL)

10.0 Introduction

Down woody materials (DWM) are important components of forest ecosystems across the country. DWM is dead material on the ground in various stages of decay. Wildlife biologists, ecologists, mycologists, foresters, and fuels specialists are some of the people interested in DWM because it helps describe the:

- Quality and status of wildlife habitats.
- Structural diversity within a forest.
- Fuel loading and fire behavior.
- Carbon sequestration – the amount of carbon tied up in dead wood.
- Storage and cycling of nutrients and water – important for site productivity.

Down wood components and fuels estimated by the FIA program are coarse wood, slash, fine wood, and litter and duff depth. The DWM protocol includes the following three suites of measurement options:

OPTION I. BASE:
The BASE option provides a minimum set of variables necessary to produce estimates for volume, biomass, carbon, and fuel load per acre on a broad scale. Base variables are required any time DWM is measured, and are labeled “BASE” in this chapter. Measurements include:

OPTION I: BASE Variables

BASE Layout: DWM SAMPLING STATUS, DWM NUMBER OF SUBPLOTS, DWM NUMBER OF TRANSECTS ON SUBPLOT, DWM TRANSECT LENGTH, DWM NOTES

BASE Transect Line Segmenting: SUBPLOT NUMBER,TRANSECT, SEGMENT CONDITION CLASS NUMBER, SEGMENT BEGINNING DISTANCE (HD), SEGMENT ENDING DISTANCE (HD), DWM TRANSECT SEGMENT SAMPLE STATUS, DWM TRANSECT NONSAMPLED REASON

BASE CWD: SUBPLOT NUMBER, TRANSECT, CWD CONDITION CLASS, PIECE ON SUBPLOT OR ANNULAR PLOT?, CWD DECAY CLASS, SPECIES, DIAMETER AT POINT OF INTERSECTION, DIAMETER OF HOLLOW AT POINT OF INTERSECTION, CWD LENGTH >=3 FEET

BASE Pile: PILE SUBPLOT NUMBER, PILE TRANSECT, PILE CONDITION CLASS NUMBER, PILE BEGINNING DISTANCE, PILE ENDING DISTANCE, COMPACTED HEIGHT OF CWD IN PILE, PILE DECAY CLASS, PILE SPECIES

BASE FWD: FWD SUBPLOT NUMBER, FWD TRANSECT, FWD CONDITION CLASS NUMBER, FWD TRANSECT SEGMENT SAMPLE STATUS, FWD TRANSECT NONSAMPLED REASON, SMALL FWD COUNT, MEDIUM FWD COUNT, LARGE FWD COUNT, HIGH COUNT REASON

BASE Duff/Litter Depth: DUFF/LITTER SUBPLOT NUMBER, DUFF/LITTER TRANSECT, DUFF/LITTER CONDITION CLASS NUMBER, DUFF/LITTER SAMPLE STATUS, DUFF/LITTER NONSAMPLED REASON, DUFF DEPTH, LITTER DEPTH, DUFF AND LITTER METHOD

OPTION II. WILDLIFE/ECOLOGICAL
This option includes all the BASE Option variables plus additional CWD structural variables. These additional measurements allow users to quantify wildlife habitat. This option is required when measuring P3 DWM.

OPTION II: WILDLIFE / ECOLOGICAL

BASE Layout Variables
BASE Transect Line Segmenting Variables
BASE CWD Variables plus the following variables required for P3 DWM:CWD HORIZONTAL DISTANCE, DIAMETER AT SMALL END, DIAMETER AT LARGE END, CWD TOAL LENGTH
BASE Pile Variables
BASE FWD Variables
BASE Duff/Litter Depth Variables

OPTION III. RAPID ASSESSMENT (CUSTOMIZED PROTOCOL):

Rapid assessments may be desired to quantify down wood abundance in specific instances (for example, following a hurricane or volcanic eruption). Because information needs and funds will vary depending on the situation, a rapid assessment option is available where the transect configuration (number of transects and subplots and transect length) can be defined by the FIA unit. However, the base variables needed to estimate biomass are still required for rapid assessments.

Additional variables found to be useful by FIA units in the past are also defined in this protocol to ensure consistency if additional information is desired by different FIA units. FIA units may also choose to classify the fuelbed conditions that determine fire behavior on each condition class using standardized national fuel models. These variables are labeled "OPTIONAL" in this chapter.

ADDITIONAL OPTIONAL VARIABLES

Optional CWD Variables (for all OPTIONs): IS THE PIECE HOLLOW?, PIECE INCLINATION, CWD HISTORY, PERCENT OF LOG CHARRED BY FIRE, LARGE END DIAMETER CLASS

Optional Fuels Variable: CONDITION FUELBED TYPE (Scott and Burgan 2005; RMRS-GTR-153)

DWM is sampled on accessible forest conditions intersected by a transect, and on accessible nonforest conditions if they are being measured on the plot (NONFOREST CONDITION CLASS STATUS = 2). If a transect crosses a condition boundary, the boundary locations on the transect are recorded. All DWM in the inventory is sampled using the line intersect sampling method (also called planar intercept method). In this method, transects are established, and individual pieces of Coarse Woody Debris (CWD, ≥3 inches diameter and ≥0.5 foot long) or Fine Woody Debris (FWD, <3 inches diameter) are tallied if the central axis of the piece is intersected by the plane of the transect.

Note: DWM is a CORE OPTIONAL indicator on all Phase 2 plots. When measured on Phase 2 plots, all the BASE data items must be measured and other data items can be added as desired (designated as P2 OPTIONAL on data items.) However, DWM is a CORE indicator on all Phase 3 plots, and both BASE and WILDLIFE/ECOLOGICAL data items must be measured (see table 3).

Table 3. DWM Protocol Options Variables

OPTION I: BASE	**OPTION II: WILDLIFE / ECOLOGICAL**	**ADDITIONAL OPTIONAL VARIABLES**
REQUIRED: BASE Layout Variables	**REQUIRED:** BASE Layout Variables	
REQUIRED: BASE Transect Line Segmenting Variables	**REQUIRED:** BASE Transect Line Segmenting Variables	
REQUIRED: BASE CWD Variables **P2 OPTIONAL:** CWD HORIZONTAL DISTANCE, DIAMETER AT SMALL END, DIAMETER AT LARGE END, CWD TOTAL LENGTH	**REQUIRED:** BASE CWD Variables, CWD HORIZONTAL DISTANCE, DIAMETER AT SMALL END, DIAMETER AT LARGE END, CWD TOTAL LENGTH, IS THE PIECE HOLLOW?	**OPTIONAL CWD Variables (for all OPTIONs):** IS THE PIECE HOLLOW?, PIECE INCLINATION, CWD HISTORY, PERCENT OF LOG CHARRED BY FIRE, LARGE END DIAMETER CLASS
REQUIRED: BASE Pile Variables	**REQUIRED:** BASE Pile Variables	
REQUIRED: BASE FWD Variables	**REQUIRED:** BASE FWD Variables	
REQUIRED: BASE Duff/Litter Depth Variables	**REQUIRED:** BASE Duff/Litter Depth Variables	
		Optional Fuels Variable: Photo-series (Scott & Burgan 2005 RMRS-GTR-153)

10.1 Definition of Down Woody Materials

Coarse Woody Debris – In this inventory, CWD includes downed, dead tree and shrub boles, large limbs, and other woody pieces that are ≥3 inches in diameter and severed from their original source of growth. CWD **also** includes dead tally species trees or single-stemmed woodland species trees (either self-supported by roots, severed from roots, or uprooted and supported by other objects) that are leaning >45 degrees from vertical and not considered part of the standing tree inventory. Portions of dead trees that are separated greater than 50 percent (either above or below 4.5 feet), are considered severed and are included in the CWD inventory (see discussion and diagrams in section 5.7.2 - Standing Dead). For multi-stemmed woodland species (Appendix 3) such as juniper, only tally stems that are dead and detached**.** Include as CWD all dead multi-stemmed woodland tree stems that do not qualify as standing dead if they meet the size requirements for CWD pieces. Also included are non-machine processed round wood such as fence posts and cabin logs.

CWD is measured primarily using intersect diameter. In rare instances when pieces are in a pile and it is impossible to estimate the size of individual pieces, use the pile protocol.

CWD does not include:

1. Woody pieces <3.0 inches in diameter at the point of intersection with the transect.
2. Dead trees leaning 0 to 45 degrees from vertical (see discussion and diagrams in section 5.7.2 - Standing Dead).
3. Dead shrubs, self-supported by their roots.
4. Trees showing any sign of life.
5. Stumps that are rooted in the ground (i.e., not uprooted).
6. Dead foliage, bark or other non-woody pieces that are not an integral part of a bole or limb. (Bark attached to a portion of a piece is an integral part).
7. Roots or main bole below the root collar.

Fine Woody Debris – In this inventory, FWD includes downed, dead branches, twigs, and small tree or shrub boles <3 inches in diameter that are not attached to a living or standing dead source. FWD can be connected to a larger branch, as long as this branch is on the ground and not connected to a standing dead or live tree. Only the woody branches, twigs, and fragments that intersect the transect are counted. FWD can be connected to a down, dead tree bole or down, dead shrub. FWD can be twigs from shrubs and vines. FWD must be no higher than 6 feet above the ground to be counted.

FWD does not include:

1) Woody pieces ≥3.0 inches in diameter at the point of intersection with the transect.
2) Dead branches connected to a <u>live</u> tree or shrub; or to a standing dead tree or dead shrub.
3) Dead foliage (i.e., pine or fir needles, or leaf petioles).
4) Bark fragments or other non-woody pieces that are not an integral part of a branch, twig, or small bole.
5) Small pieces of decomposed wood (i.e., chunks of cubical rot)

10.2 Locating and Establishing Line Transects

Transects are established on each subplot if the subplot center is accessible (i.e., not census water, access denied, or hazardous), and there is at least one forest or measured nonforest land condition class mapped within the 24.0-foot radius subplot (CONDITION CLASS STATUS = 1 or (NONFOREST CONDITION CLASS STATUS = 2)). Transects begin at the subplot center and extend 24.0 feet to the edge of the subplot. The location of condition class boundaries are recorded along the transect, starting at the subplot center and working towards the fixed radius plot boundary. It is extremely important to lay out the transect in a straight line to avoid biasing the selection of pieces and to allow the remeasurement of transect lines and tally pieces for QA purposes.

Transect lines should be marked with a pin or small piece of flagging at the end of the line (24.0 feet, horizontal distance) to help the QA staff identify the path of the transect during the check-plot procedure.

Because the tolerance for the transect azimuth is +/- 2 degrees, the line might have been laid down in a slightly different direction from the check-plot crew. This could affect the location of diameter measurements for CWD pieces as well as identifying whether a CWD piece is a valid tally piece. It is also helpful to mark the point where the FWD transect begins (14 feet, horizontal distance).

10.2.1 CWD Transects

Two transects are established that originate at the subplot center and extend out 24.0 feet horizontal distance (the radius of the subplot) (fig. 60). This transect configuration was chosen to avoid sampling bias on sloped land, where it is possible that CWD may be oriented in one direction. This configuration of transects should pick up CWD logs that are lying parallel to the slope, perpendicular to the slope, and across slope. On plots where the macroplot is measured and mapped for condition classes, FIA units have the option of extending transects up to 58.9 feet from subplot center. In addition, an optional third transect on each subplot provides the ability to add or retain transect length on P3 plots.

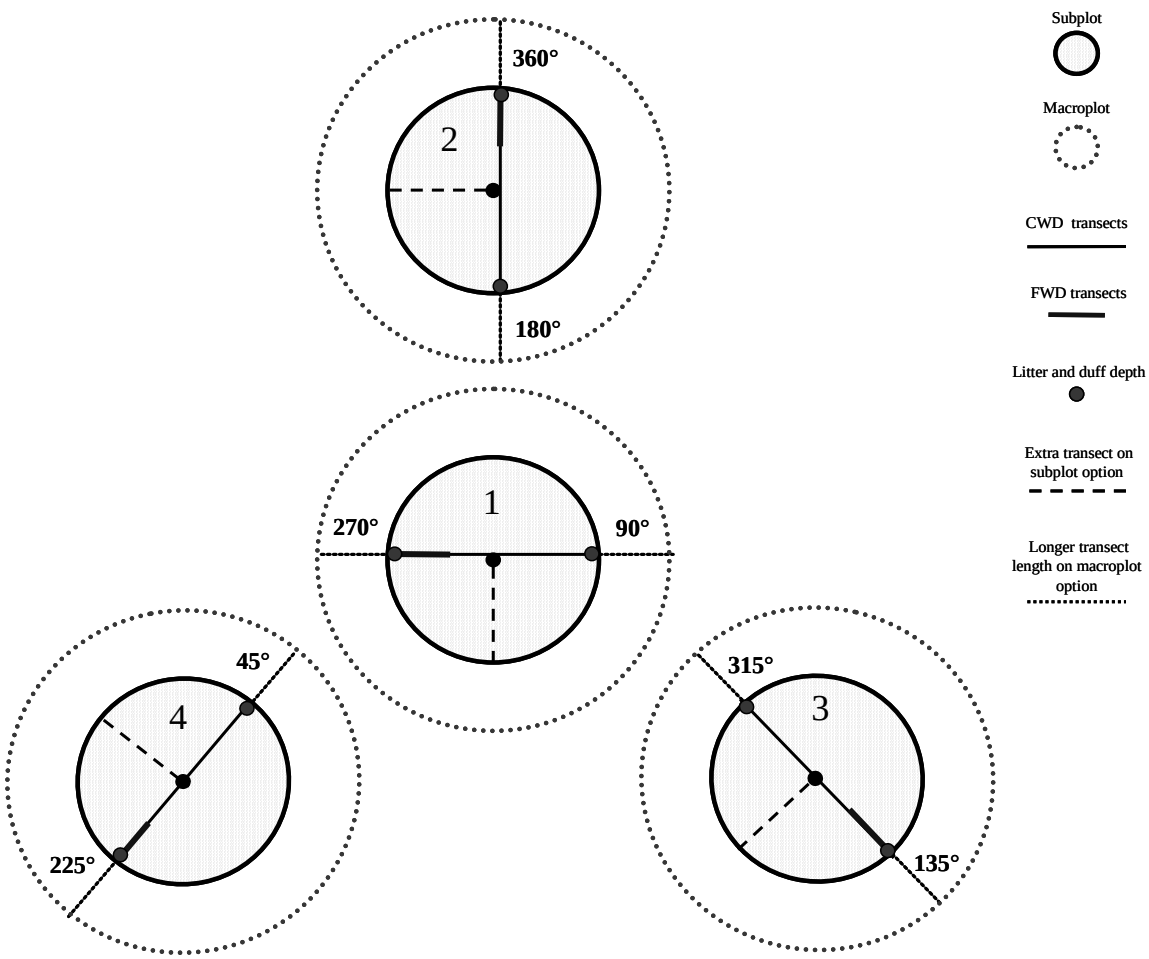


Figure 60. Plot layout for sampling CWD, FWD, and litter and duff depth. CWD transects include two 24-foot transects per subplot (starting at subplot center designated by its azimuth as labeled), optional extension onto condition mapped macroplots, and optional third transect for CWD.

10.2.2 FWD Transects

On a portion of one CWD transect on each subplot, FWD is tallied within 3 size classes. Because FWD is generally present in high densities, a shorter transect will pick up an acceptable amount of tally. The transect begins at 14 feet (horizontal distance) from the subplot center and extends out either 6 or 10 feet (horizontal distance) depending on the FWD size class, as follows:

Category of FWD	Size Class	Diameter range	Transect length (horizontal distance)	Transect location (horizontal distance)
Small FWD	1	0 in to 0.24 in	6 feet	14 to 20 feet
Medium FWD	2	0.25 in to 0.9 in	6 feet	14 to 20 feet
Large FWD	3	1.0 in to 2.9 in	10 feet	14 to 24 feet

It is helpful to have a size gauge available until your eye is 'trained' to recognize the 3 FWD size classes. Examples include a plastic or cardboard card with 3 notches cut for each size class, or a set of 3 dowels representing each size class.

10.3 Transect Line Segmenting

Transect lines are segmented to determine the length of transect that occurs within each mapped condition class intersecting the line. These lengths determine the expansion factors for the measured DWM. It is important that any changes or corrections to condition identity, location and size mapped on the subplot/macroplot spatially match the segmentation done on the transects. A segment is a length of transect that is in one condition. Segments are identified by recording the BEGINNING DISTANCE and ENDING DISTANCE from subplot center towards the end of the transect.

If any part of the transect segment is in a measured condition but the CWD is not measurable (e.g., snow or water), do not measure any DWM (CWD, FWD, or duff/litter depth) on that transect segment and set DWM TRANSECT SEGMENT SAMPLE STATUS = 0.

Starting at the subplot center and working towards the fixed radius plot boundary, each segment of transect line in a different condition class is delineated and recorded as a separate record. The horizontal BEGINNING DISTANCE and ENDING DISTANCE are recorded for each condition class encountered (fig. 61). The first record for each transect will have a BEGINNING DISTANCE of 0 feet. If only one condition class occurs on the transect line, only one segment is recorded. The last segment on all transects must have an ENDING DISTANCE of 24.0 feet horizontal distance if sampling the subplot, or up to DWM TRANSECT LENGTH if sampling on the macroplot. All condition segments on the transect must be defined and all transect length recorded and accounted for, either by condition, or by DWM TRANSECT SEGMENT SAMPLE STATUS.

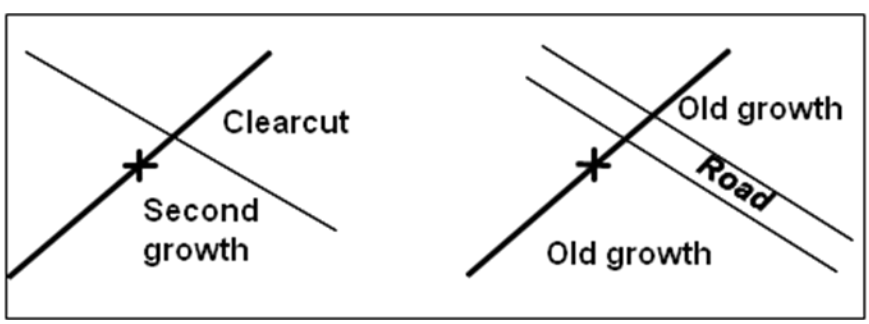


Figure 61. Transects are installed across condition class boundaries.

10.3.1 SUBPLOT NUMBER (BASE)

Record the code indicating the subplot center from which the transect originates.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

10.3.2 TRANSECT (BASE)

Record the transect azimuth (degrees) on which a condition class is being delineated. These transects, when being installed, have a tolerance of +/- 2 degrees.

Values:

Subplot	Transect direction (degrees) from center of subplot
1	090
1	270
1	180 (Extra optional transect)
2	360
2	180
2	270 (Extra optional transect)
3	135
3	315
3	225 (Extra optional transect)
4	045
4	225
4	315 (Extra optional transect)

10.3.3 SEGMENT CONDITION CLASS NUMBER (BASE)

Record the code indicating the number of the condition class for the transect segment. Use the same code assigned to the condition class on the subplot or elsewhere on the plot. The first segment recorded for each transect will have the same CONDITION CLASS NUMBER as assigned to the subplot center.

Values: 1 to 9

10.3.4 SEGMENT BEGINNING DISTANCE (BASE)

Record the location (using horizontal distance to nearest 0.1 foot) on the transect line where the transect intersects the boundary with the adjacent condition class nearer to the subplot center. The first record for each transect will have a BEGINNING DISTANCE of 0 ft. Each subsequent record will have a BEGINNING DISTANCE equal to the ENDING DISTANCE of the previous record.

Values: 00.0 to 58.9 horizontal feet

10.3.5 SEGMENT ENDING DISTANCE (BASE)

Record the location (using horizontal distance to nearest 0.1 foot) on the transect line where the transect exits the condition class being delineated and intersects the boundary with a different condition class further away from the subplot center. If no other condition classes are encountered, record the location (using horizontal distance) of the end of the transect line.

Values: 00.1 to 58.9 horizontal feet

10.3.6 DWM TRANSECT SEGMENT SAMPLE STATUS (BASE)

Record the sample status for the transect segment. If any part of the segment is in an accessible condition that would be measured (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2), but the CWD is not measurable due to an obstruction such as snow or water, do not measure DWM on any part of the transect segment, and set code to 0 for that segment. In all other situations, set the code to 1. For conditions on which DWM would not be measured regardless (CONDITION CLASS STATUS = 3 or NONFOREST CONDITION CLASS STATUS = 2), will automatically be coded 1; those conditions should be identified in the transect segmenting.

Values:

Value	Description
0	Transect segment not sampled
1	Transect segment sampled

10.3.7 DWM TRANSECT SEGMENT NONSAMPLED REASON (BASE)

Record the reason that DWM cannot be measured on the transect.

Values:

Value	Description
04	Time Limitation
05	Lost data (office use only)
10	Other (for example, snow or water covering CWD that is supposed to be sampled). “Note required” when using this code.

10.4 Sampling Methods for COARSE WOODY DEBRIS (CWD)

10.4.1 Tally Rules for Coarse Woody Debris (CWD)

1. Coarse woody debris (CWD) is sampled on accessible forest conditions, and on accessible nonforest conditions if they are being measured on the plot (i.e., NONFOREST CONDITION CLASS STATUS = 2). Tally CWD by starting at the subplot center and working towards the fixed radius plot boundary. Measurements should **not** be taken along transects moving inward toward subplot center. Tally a piece if its central longitudinal axis intersects the transect, and the condition class is measured at the point of intersection (fig. 62). The entire piece is assigned to this condition.

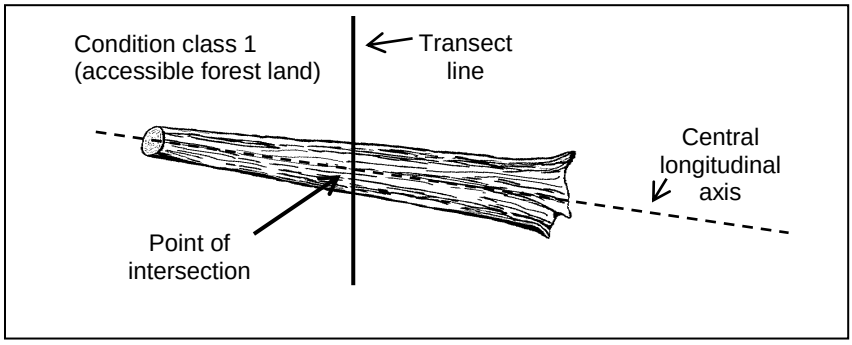


Figure 62. Tally rules for CWD.

2. Tally dead trees and tall stumps that are leaning > 45 degrees from vertical. Do not tally live trees or standing dead trees and tall stumps that are still upright and leaning < 45 degrees from vertical. Follow the same rules for down trees as outlined in section 5.0 'Tree and Sapling Data' for determining what qualifies as standing and down dead trees and portions/tops of trees. Most CWD will be laying on the ground.

   Note: In order to avoid double counting or totally missing trees or portions in either protocol, once a decision is made on whether a tree or portion/top of a tree is considered standing or down it is important to include it in either one or the other protocol (standing tree or CWD), but not both. See additional diagrams in section 5.7.2 – Standing Dead.

3. The minimum length for any tally piece is 0.5 feet and it needs to meet the minimum transect diameter guidelines.

4. Decay class of the piece determines whether or not the piece is tallied (see section 10.4.3.6).

   For decay classes 1 to 4: tally a piece if it is ≥3.0 inches in diameter at the point of intersection with the transect (fig. 63).

   For decay class 5: tally a piece if it is ≥5.0 inches in diameter at the point of intersection and ≥5.0 inches high from the uphill side of the ground. The reason for treating decay class 5 pieces differently is because they are difficult to identify, especially when heavily decomposed. Only pieces that still have some shape and log form are tallied—humps of decomposed wood that are becoming part of the duff layer are not tallied.

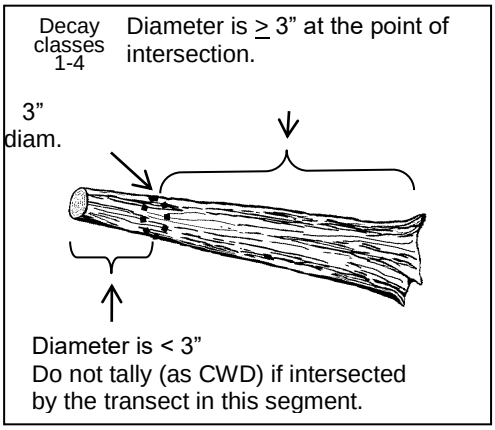


Figure 63. Tally rules for CWD decay classes 1-4.

5. Tally pieces created by natural causes (examples: natural breakage or uprooting) or by human activities such as cutting. In some cases it may be impossible to measure or estimate individual pieces—for example when CWD pieces are in machine-piled slash piles or windrows, or are part of jumble from flooding, landslide or avalanche. In these situations, piles are described using the instructions in section 10.6 'Sampling Residue Piles'. Because biomass estimates from piles have great uncertainty associated with them, pieces should be measured individually if at all possible.

6. Tally a piece only if the point of intersection occurs above the ground. If one end of a piece is buried in the litter, duff, or mineral soil, the piece ends at the point where it is no longer visible. Measure the diameter and length at this point.

7. If the central longitudinal axis of a piece is intersected more than once on a transect line or if it is intersected by two transect lines, tally the piece each time it is intersected (uncommon situation, see fig. 64).

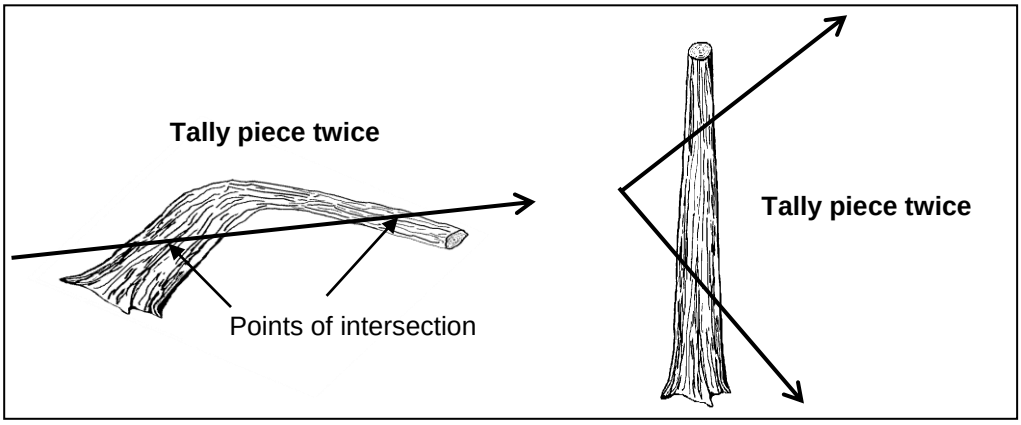


Figure 64. CWD tally rules: intersections.

8. Tally a piece only once if the subplot center falls directly on the central longitudinal axis of the piece. Tally the piece on the smallest azimuth degree transect.

9. If a piece is fractured across its diameter or length, and would pull apart at the fracture if pulled from either end or sides, treat it as two separate pieces. If judged that it would not pull apart, tally as one piece. Tally only the piece intersected by the transect line.

10. Do not tally a piece if it intersects the transect on the root side of the root collar. Do not tally roots.

11. When the transect crosses a forked down tree bole or large branch connected to a down tree, tally each qualifying piece separately. To be tallied, each individual piece must meet the minimum diameter requirements.

12. In the case of forked trees, consider the "main bole" to be the piece with the largest diameter at the fork. Variables for this fork such as TOTAL LENGTH and DECAY CLASS should pertain to the entire main bole. For smaller forks or branches connected to a main bole (even if the main bole is not a tally piece), variables pertain only to that portion of the piece up to the point where it attaches to the main bole (see figure 65).

13. If a transect intersects a non-measured condition (e.g., a road when NONFOREST CONDITION CLASS STATUS = 5, or an inaccessible condition class, or a non-sampled code for CWD), CWD is not tallied.

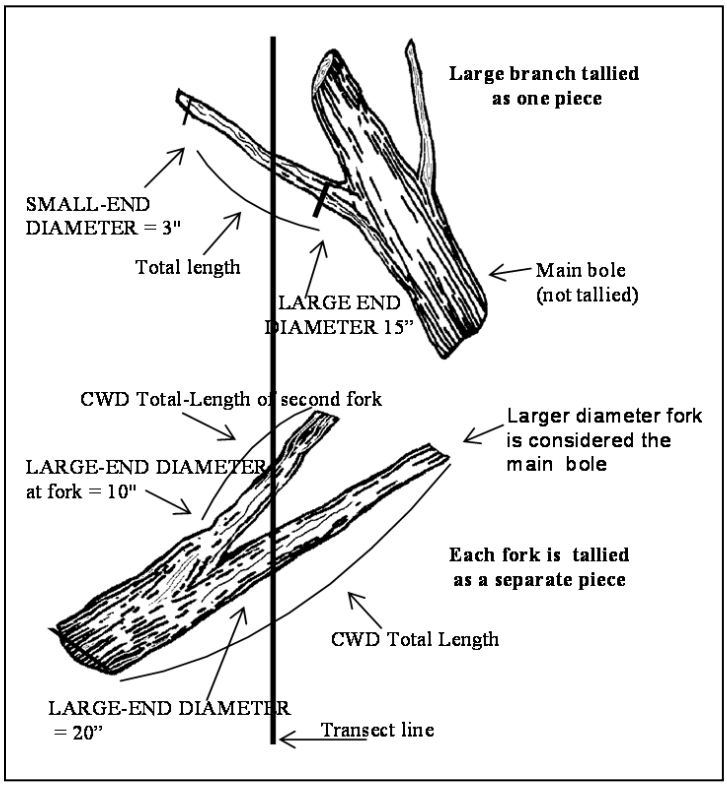


Figure 65. CWD tally rules for forked trees.

10.4.2 Marking CWD (OPTIONAL)

Marking CWD is highly recommended if allowed by the land owner—wax crayon is a good option or nails can be used as well. Marked CWD is an aid to future crews returning to the plot for a QA check.

10.4.3 Recording Procedures for CWD

10.4.3.1 SUBPLOT NUMBER (BASE)

Record the code indicating the number of the subplot center from which the transect originates.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

10.4.3.2 TRANSECT (BASE)

Record the azimuth of the transect on which the CWD piece is sampled.

Values:

Subplot	Transect direction (degrees) from center of subplot
1	090
1	270
1	180 (Extra optional transect)
2	360
2	180
2	270 (Extra optional transect)
3	135
3	315
3	225 (Extra optional transect)
4	045
4	225
4	315 (Extra optional transect)

10.4.3.3 CWD CONDITION CLASS (BASE)

Record the condition class number for each CWD piece at the point where the central longitudinal axis of the piece intersects the transect. If there is only one condition on the plot all CWD pieces will be assigned to CWD condition class = 1. If more than one condition has been identified and/or mapped on the plot/subplot, record the appropriate condition based on the location of the transect diameter measurement. All CWD pieces require a condition class and only classes that have been identified and/or mapped are valid. If extending the transect onto the macroplot the entire macroplot needs to be mapped for conditions.

Values: 1 to 9

10.4.3.4 PIECE ON SUBPLOT OR ANNULAR PLOT? (BASE)

Identify whether point of transect intersection with piece is on the subplot or macroplot. If not extending transects onto annular plots all pieces will be assigned code = 1.

Values:

Value	Description
1	Central longitudinal axis of piece intersects the transect on the subplot (<= 24.0 horizontal feet)
2	Central longitudinal axis of piece intersects the transect on the macroplot (24.1 – 58.9 horizontal feet)

10.4.3.5 CWD HORIZONTAL DISTANCE (WILDLIFE OPTION)

Record the horizontal distance from the subplot center to the point where the transect intersects the longitudinal center of the piece. If two or more pieces have the same horizontal distances, record the top piece first. CWD HORIZONTAL DISTANCE may be useful for verifying condition class, for QA checks, or for studies of different transect lengths.

Values: 00.0 to 58.9

10.4.3.6 CWD DECAY CLASS (BASE)

Record a 1-digit code indicating the decay class of the piece. Code the decay class that predominates along the observed length of the piece. Use the guide below to determine CWD DECAY CLASS.

Values:

Decay Class	Structural Integrity	Texture of Rotten Portions	Color of Wood	Invading Roots	Branches and Twigs
1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish-brown or original color	Sapwood only	Branch stubs will not pull out
4	Heartwood rotten; piece does not support its own weight, but maintains its shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Through-out	Branch stubs pull out
5	None, piece no longer maintains its shape, it spreads out on ground	Soft; powdery when dry	Red-brown to dark brown	Through-out	Branch stubs and pitch pockets have usually rotted down

Note: CWD DECAY CLASS 5 pieces can be difficult to identify because they often blend into the duff and litter layers. They must still resemble a log; therefore, the first tally rule is that they must be ≥5.0 inches in diameter and ≥ 5.0 inches from the surface of the ground. Decomposed logs that are slightly elevated 'humps' on the ground are not tallied.

CWD DECAY CLASS: The chart above was developed primarily for Douglas-fir in the Pacific Northwest. At the present time, there are no other charts available to use to describe decay classes for other species or locations. Concentrate on the structural integrity and texture when estimating a decay class for CWD logs.

If a log is case hardened (hard, intact outer sapwood shell) but the heartwood is rotten, code this log as a CWD DECAY CLASS 2. CWD DECAY CLASS 1 should be reserved for 'freshly fallen' logs that are completely intact (i.e., recent windfalls, or harvest).

10.4.3.7 SPECIES (BASE)

Record the code indicating the species of the piece. Since CWD pieces are not necessarily always tally species, record the most detailed available species code (see appendix 3). Some

species codes are only genus specific (e.g., Prunus), or hardwood-softwood specific. Search for the species code that has the most detail for the identified piece. For shrubs or vines enter unknown softwood (0299) or hardwood (0998).

Species identification may be uncertain for some pieces. The piece's bark (either attached or sloughed and laying beside the piece), branching pattern (if the branches are still present), or heartwood smell (particularly if cedars, Douglas-fir, or western hemlock) may provide clues. On remeasurement plots, see what tree species were tallied in past inventories. One way to distinguish hardwoods from softwoods is by the type of decay present. Hardwoods usually have a white or grayish stringy rot, while softwoods usually have a reddish-brown blocky rot. If it is not possible to identify the species, attempt to estimate if it is softwood or hardwood. Enter code 0299 for unknown dead conifer or 0998 for unknown dead hardwood. If all else fails, enter the unknown SPECIES code (0999).

Values: See species codes in appendix 3

10.4.3.8 Diameters

If possible, the best way to measure diameter is to wrap the tape perpendicular to the longitudinal axis at the point of transect intersection (fig. 66). If that is not possible it is useful to carry a steel carpenters retracting tape to measure diameters. Other methods include wrapping a tape around the bole if possible, holding a straight-edge ruler above the piece, or using calipers.

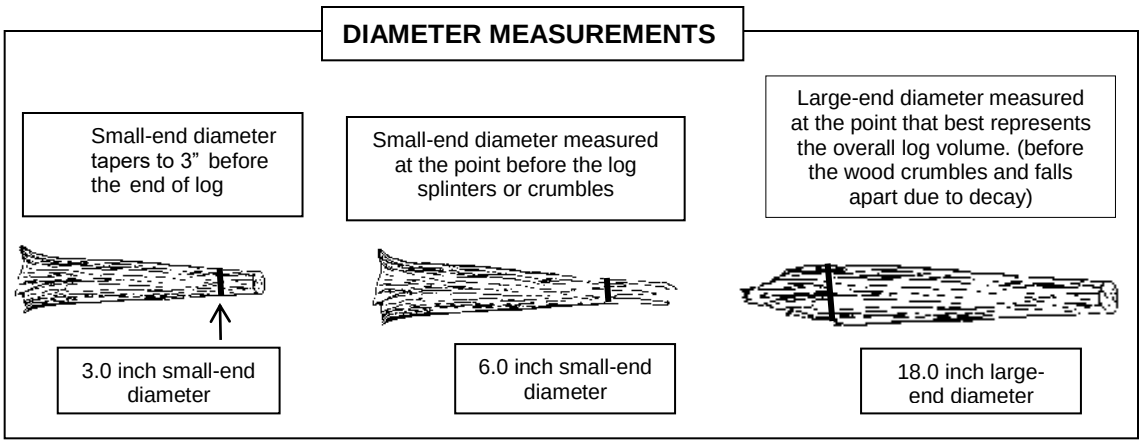


Figure 66. Diameter measurements

For pieces that cannot be taped and are not round in cross-section because of missing chunks of wood or "settling" due to decay, measure the diameter in two directions and take an average. Estimate the longest and shortest axis of the cross-section ("A" and "B" in figure 67), and enter the average in the diameter field. This technique applies to intersect, small-end, and large-end diameters.

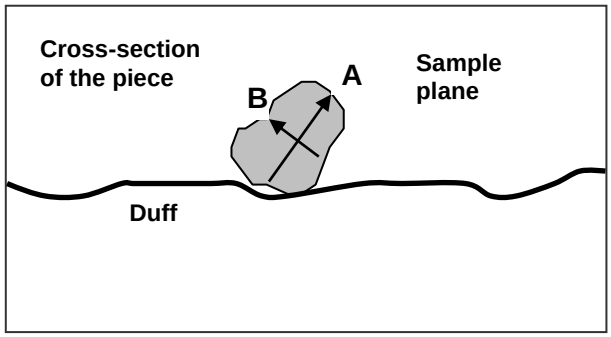


Figure 67. Estimating the diameter of pieces that are not round in cross-section.

If the transect intersects the log at the decayed or splintered end (fig. 68), record the diameter at this location as the intersect diameter. Record the large end and small end diameters on the same side of the transect diameter as illustrated. Record the small end diameter as 3 inches if it tapers below 3 inches. If the splintered end appears to be two separate pieces (i.e., a major split located just at the end) – in this situation treat it as one log and take a diameter around the end (take two measurements if it is odd shaped.

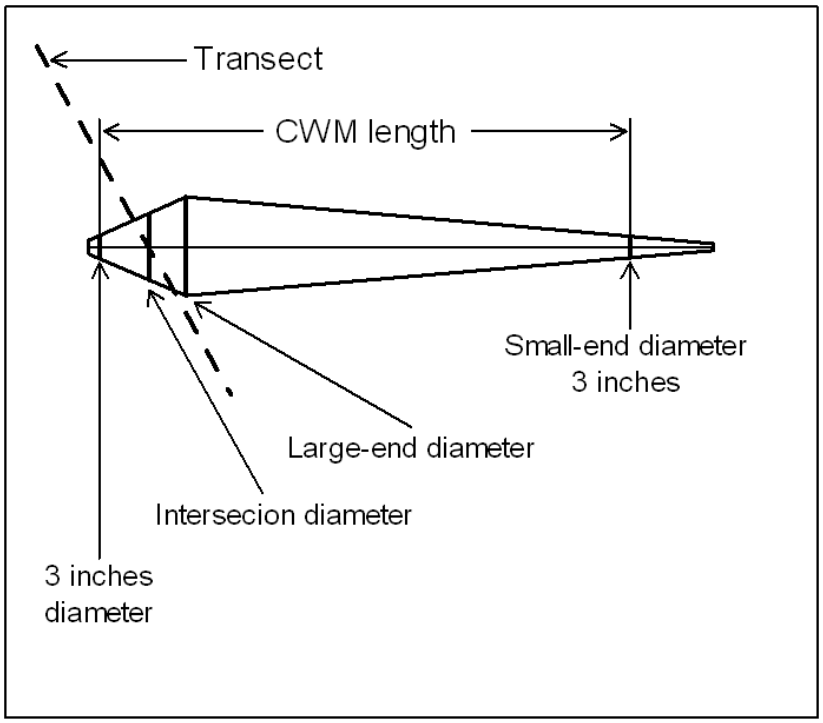


Figure 68. Example of decayed end intersecting the transect

10.4.3.8.1 DIAMETER AT POINT OF INTERSECTION (BASE)

Record the piece's diameter at the point where the transect intersects the longitudinal center of the piece. Record the diameter to the nearest inch. If the diameter is close to 3 inches, measure the diameter to the nearest 0.1 inch to determine if the piece is actually $\geq$3.0 inches and a valid tally piece.

Values: 003 to 200 inches

10.4.3.8.2 DIAMETER OF HOLLOW AT POINT OF INTERSECTION (BASE)

Record the diameter of hollow at the point of intersection. This variable contributes to reducing bias in biomass estimate and only applies to the point of intersection. If it can be ascertained that the piece is hollow at the transect diameter location, measure or estimate the diameter of hollow to the nearest inch, otherwise record as 0. Diameter of hollow must be less than the transect diameter. Note: Record a hollow diameter only when it is obvious that a piece is hollow at the point of intersection (a hole or crack in the piece, evidence of hollow as observed from the end, etc.). Unlike 10.4.3.10, there is no hollow size requirement for this variable.

Values: 000, 001 to 200 inches

10.4.3.8.3 DIAMETER AT THE SMALL END (WILDLIFE OPTION)

Record the diameter at the piece's small end. The diameter is recorded to the nearest inch. The DIAMETER AT THE SMALL END occurs either at (1) the actual end of the piece, if the end has a diameter ≥3.0 inches, or (2) at the point where the piece tapers down to 3.0 inches in diameter. If the end is splintered or decomposing (sloughing off), measure the diameter at the point where it best represents the overall log volume. Use the same measuring procedures described in 10.4.3.8 (see figure 66).

Values: 003 to 200 inches

10.4.3.8.4 DIAMETER AT THE LARGE END (WILDLIFE OPTION)

Record the diameter at the piece's large end. The diameter is recorded to the nearest inch. The large end will occur either at a broken or sawn end, at a fracture, or at the root collar. If the end is splintered or decomposing (sloughing off), measure the diameter at the point where it best represents the overall log volume. Use the same measuring procedures used for 10.4.3.8.

Values: 003 to 250 inches

10.4.3.9 Length Measurements

Measure the length of the piece (to the nearest foot) along its centerline, either to the end of the piece or to the point where the diameter reaches 3 inches. If the piece tapers at both sides, due to decay or breakage, the length is measured for the 3-inch diameter cutoff at both ends, regardless of where the large end-diameter may be (see fig. 68). No length is recorded for pieces <3 feet long.

10.4.3.9.1 CWD LENGTH >= 3 FEET (BASE)

Record the code that indicates whether the CWD TOTAL LENGTH is less than 3 feet long (and at least 0.5 foot long). Distinguished length orientation by direction of the pith. Note: the diameter of a small piece may be larger than its length. Total length of the log is measured between the physical ends of the log.

Values:

Value	Description
1	CWD TOTAL LENGTH ≥3 feet
2	CWD TOTAL LENGTH ≥0.5 foot and < 3 feet

10.4.3.9.2 CWD TOTAL LENGTH (WILDLIFE OPTION)

Record the total length of the piece to the nearest foot. For DECAY CLASS = 5, DIAMETER AT THE SMALL END and DIAMETER AT THE LARGE END are not recorded for a log, therefore the length is measured between the two physical ends of the log. For curved logs, measure along the curve. CWD TOTAL LENGTH is recorded to the nearest foot.

Values: 003 to 250 feet

10.4.3.10 IS THE PIECE HOLLOW? (OPTIONAL)

Record the code indicating whether or not the piece is hollow (see figure 69). This definition of hollow is different from the definition used in 10.6.3.8.2 DIAMETER OF HOLLOW AT POINT OF INTERSECTION. This variable provides information for wildlife assessment.

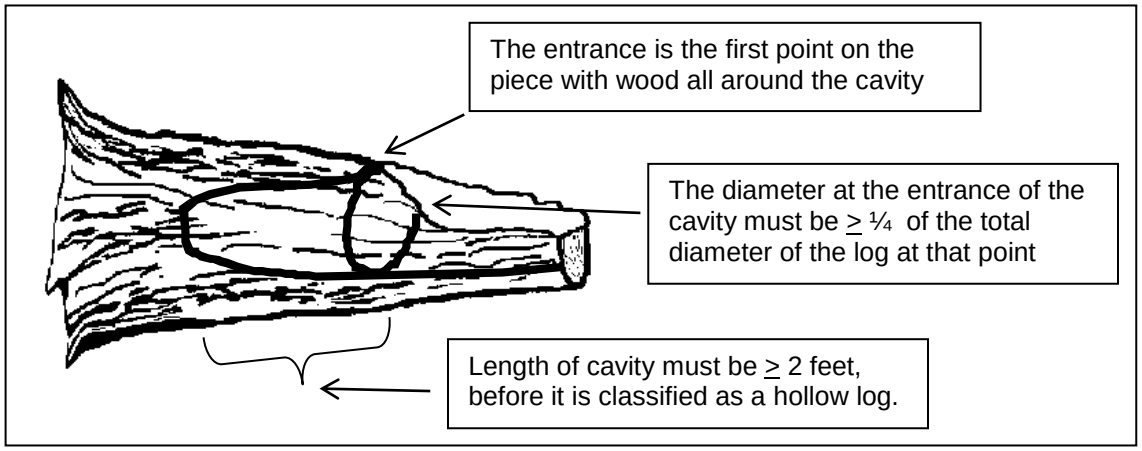


Figure 69. Determining if the piece is hollow.

Values:

Value	Description
0	Does not meet criteria for being a hollow log
1	A piece is considered hollow if a cavity extends at least 2 feet along the central longitudinal axis of the piece, and the diameter of the entrance to the cavity is at least 1/4 of the diameter of the piece where the entrance occurs. The entrance occurs at the point where the circumference of the cavity is whole -- the point where wood is present completely around the circumference of the cavity. The length of the cavity begins at this point. This definition of hollow is different from the definition used in 10.4.3.8.2 DIAMETER OF HOLLOW AT POINT OF INTERSECTION.

10.4.3.11 PIECE INCLINATION (OPTIONAL)

Record the inclination from horizontal of the piece in degrees. Measure the inclination with a clinometer. Inclination from horizontal should be estimated rapidly by setting a clinometer along the top of the log, adjusting if necessary to match the angle between the location of the large end diameter and the location of the small end diameter, and reading the inclination from the face of the clinometer in degrees.

Values: 00 to 90 degrees

10.4.3.12 CWD HISTORY (OPTIONAL)

Record the code that indicates whether or not the piece of CWD is on the ground as a result of harvesting operations or as a result of natural circumstances. One objective of this item is to identify those pieces that are considered logging residue. If the piece appears to have fallen to the ground as a result of natural causes such as decomposition or windfall, enter a code of 1. This category would include blown out tops, snapped off boles, wind-fallen trees on clearcut edges, and trees that basically collapsed and fell over due to decomposition.

If the piece is on the ground as a result of recent (since last annual remeasurement; if the plot is new, the time between the panel remeasurements) harvesting activity, either because the tree was cut down with a chainsaw (or other device) or pushed over by harvesting equipment (bulldozer), enter a code of 2. A code of 2 would be considered logging residue (usually you are in the middle of a recent clearcut).

If the piece is on the ground as a result of older (more than 15 years) harvesting activity, enter a code of 3. This would be a situation where you tally an old decomposing log that has a sawn end – if it appears that the log was cut and left on site, then enter a code of “3”.

If a piece is on the ground as a result of incidental harvest (such as a standing tree was cut for firewood or small clearing), enter a code of “4”. Incidental harvest involves a few trees and is not a part of a major organized harvesting operation.

If the crew cannot decide the history of the CWD log, classify it as “unknown”, and give it a code of “5”.

Values:

Value	Description
1	CWD piece is on the ground as a result of natural causes
2	CWD piece is on the ground as a result of major recent harvest activity (<= 15 yrs old)
3	CWD piece is on the ground as a result of older harvest activity (> 15 yrs old)
4	CWD piece is on the ground as a result of an incidental harvest (such as firewood cutting)
5	Exact Reason Unknown

10.4.3.13 PERCENT OF LOG CHARRED BY FIRE (OPTIONAL)

Record a code that represents the percentage of the log’s surface area that has been charred by fire. Only examine the visible surface of the log. These data will be used by wildlife biologists to determine the impact fire has had on wildlife habitat. Wildlife tend to avoid charred logs because fire seals the wood making it slow to rot and hard to excavate.

Values:

Value	Description
0	None of the log is charred by fire
1	Up to 1/3 of the log is charred by fire
2	1/3 to 2/3 of the log is charred by fire
3	2/3 or more of the log is charred by fire

10.4.3.14 LARGE END DIAMETER CLASS (OPTIONAL)

Estimate the appropriate class code for the large end diameter for each CWD piece. If the large end diameter is close to a class breaking point it may be necessary to directly measure

the diameter. Use the same established rules for determining the large end diameter point (see figure 68).

Values:

Value	Description
1	3.0 to 4.9 inches
2	5.0 to 8.9 inches
3	9.0 to 14.9 inches
4	15.0 to 20.9 inches
5	21.0 to 39.9 inches
6	40.0+ inches

10.5 SAMPLING RESIDUE PILES

A pile is an accumulation of large woody material in which individual pieces are impossible to tally separately. Piles may be created by human activity or natural causes. However, loose piles created by windthrow, landslides, fires or other natural causes, or by thinning or logging operations, should be tallied using the regular CWD protocols unless it is physically impossible to separate individual pieces. The pile protocol should only be used as a last resort, when the regular CWD protocols cannot be used.

Piles are tallied only if intersected by a transect and located in an accessible forest condition class (CONDITION CLASS STATUS = 1) or a measurable nonforest condition (NONFOREST CONDITION CLASS STATUS = 2). An estimate of the length and depth of the pile, species composition and decay class are recorded:

1. Tally individual pieces along the transect until it is not possible to measure them separately and record the horizontal transect distance to this point. Then, record the horizontal transect distance to the point where individual pieces can again be tallied separately (see figure 70).

2. If the pile straddles two condition classes, assign it to the condition class that is closest to subplot center along the transect.

3. Estimate the average height of the pile along the transect. Visually compact the pile to estimate the height of wood, excluding air, rocks, debris and pieces of wood less than 3 inches in diameter at the plane of intersection with the transect. There is a tendency to overestimate the proportion of the cross-section of the pile made of wood. Note that when packing perfect circles of equal diameter, the maximum attainable packing ratio is less than 90% (see figure 71).

4. Record the predominant species in the pile. If it is not possible to identify the species, or if there is an even mixture of several species, record the genus, or hardwood / softwood code.

5. Record the predominant decay class of the pieces in the pile.

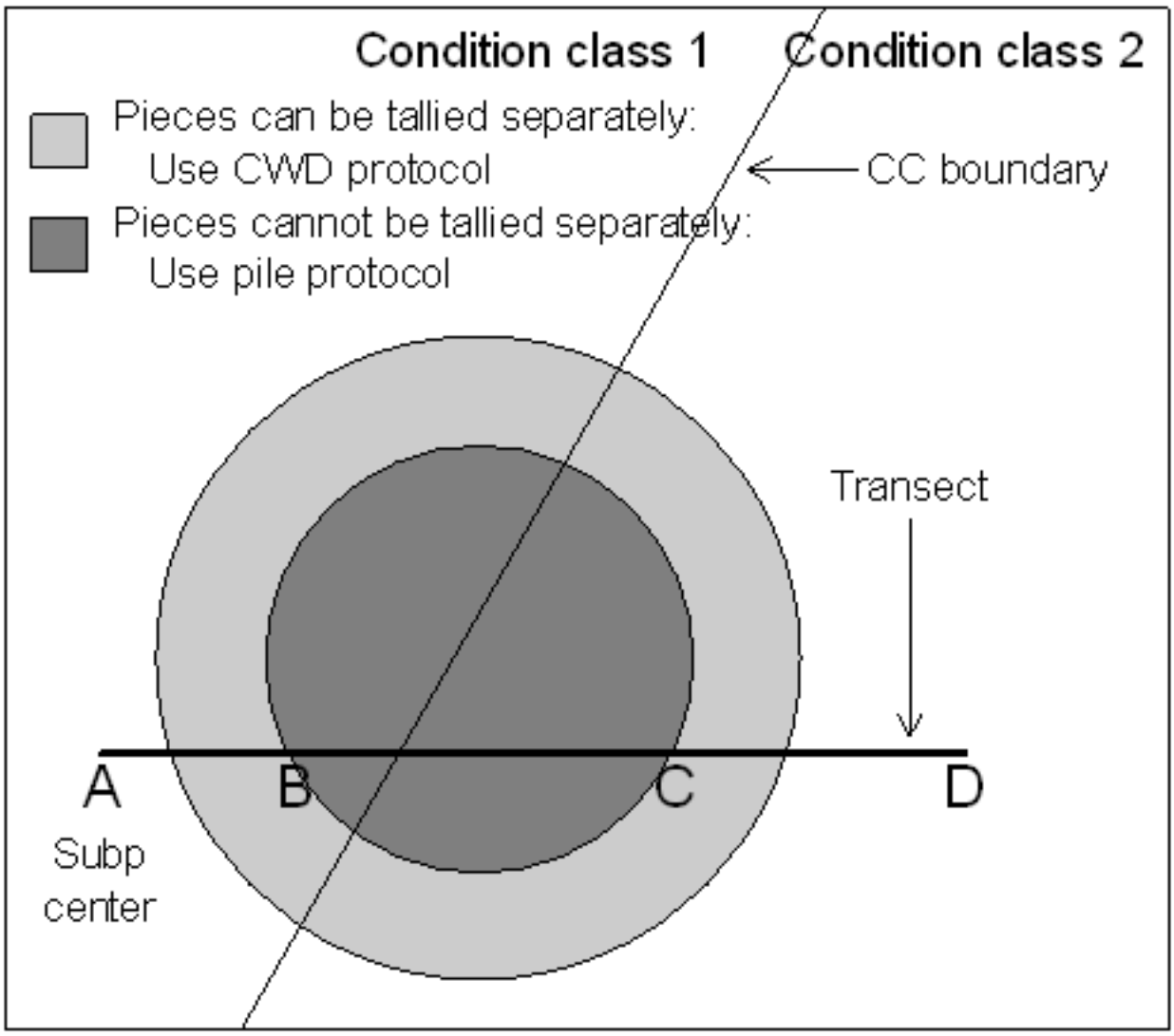


Figure 70. Example for measuring a pile. Pieces can be identified and tallied separately between points A-B and C-D, so the CWD protocols are used, even though part of the transect may be within the pile. Between points B and C, pieces cannot be tallied separately and the pile protocol is used. Enter the horizontal distance at B as the pile beginning distance, the horizontal distance at C as the pile ending distance, and estimate the compacted height of wood, predominant species, and predominant decay class between B and C. Assign the entire pile to condition class 1.

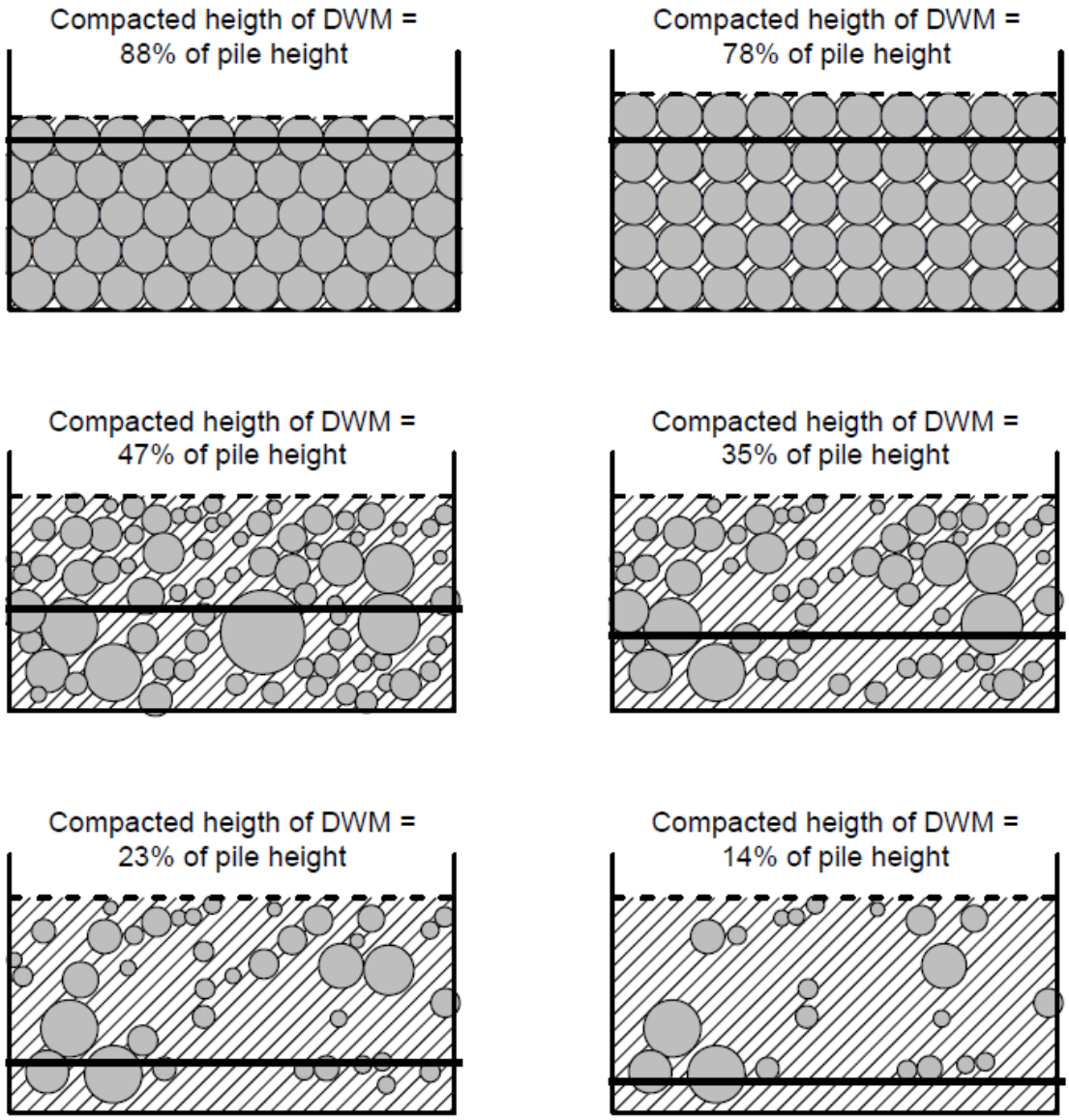


Figure 71. Calculating compacted height of CWD. The dashed line represents the height of the pile, the solid, thick line the compacted height of wood. Grey circles are cross sections of woody pieces greater than 3 inches of diameter and the fill represents debris, air and smaller pieces of wood.

10.5.1 PILE SUBPLOT NUMBER (BASE)

Record the code indicating the number of the subplot center from which the transect originates.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

10.5.2 PILE TRANSECT (BASE)
Record the azimuth of the transect on which the pile is sampled.

Values:

Subplot	Transect direction (degrees) from center of subplot
1	090
1	270
1	180 (Extra optional transect)
2	360
2	180
2	270 (Extra optional transect)
3	135
3	315
3	225 (Extra optional transect)
4	045
4	225
4	315 (Extra optional transect)

10.5.3 PILE CONDITION CLASS NUMBER (BASE)
Record the code indicating the number of the condition class. If the pile straddles two condition classes, assign it to the one closest to subplot center along the transect.

Values: 1 to 9

10.5.4 PILE BEGINNING DISTANCE (BASE)
Record the horizontal length of the transect to the beginning of the pile (to the nearest 0.1 foot), defined as the point when pieces cannot be tallied individually. If the pile occupies subplot center, record 00.0 for the beginning distance.

Values: 00.0 to 58.8 feet

10.5.5 PILE ENDING DISTANCE (BASE)
Record the horizontal length of the transect to the end of the pile, defined as the point when pieces can be tallied individually again. If the transect ends within the pile, record DWM TRANSECT LENGTH.

Values: 00.1 to 58.9 feet

10.5.6 COMPACTED HEIGHT OF CWD IN PILE (BASE)
Record average height of wood pieces greater than 3 inches in diameter at the intersection of the transect with the pile. Record value to the nearest foot. Visually compact the pile to estimate the height of wood, excluding air, debris and pieces of wood less than 3 inches in diameter at the point of intersection with the transect. If the transect starts or ends within a pile, only consider the portion of cross-section of the pile above the measured transect.

Values: 1 to 99 feet

10.5.7 PILE DECAY CLASS (BASE)

Record a 1-digit code indicating the predominant decay class in the pile. Use the guide below to determine CWD DECAY CLASS.

Values:

Decay Class	Structural Integrity	Texture of Rotten Portions	Color of Wood	Invading Roots	Branches and Twigs
1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish-brown or original color	Sapwood only	Branch stubs will not pull out
4	Heartwood rotten; piece does not support its own weight, but maintains its shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Through-out	Branch stubs pull out
5	None, piece no longer maintains its shape, it spreads out on ground	Soft; powdery when dry	Red-brown to dark brown	Through-out	Branch stubs and pitch pockets have usually rotted down

10.5.8 PILE SPECIES (BASE)

Record the code indicating the predominant species / species group in the pile. If it is not possible to identify the species, or if there is an even mixture of several species, record the genus, or hardwood / softwood code.

Values: See species codes in appendix 3

10.6 Sampling Methods for Fine Woody Debris (FWD)

1. Fine Woody Debris (FWD) is only sampled on accessible forest land conditions (CONDITION CLASS STATUS = 1) and measurable nonforest conditions (NONFOEST CONDITION CLASS STATUS = 2) intersected by the transect. FWD is tallied on the outer portion of the following transects: 270°on subplot 1, 360°on subplot 2, 135°on subplot 3, and 225°on subplot 4. The length of FWD transects is measured in horizontal distance, starting at 14.0 feet and extending for 6.0 or 10.0 feet depending on FWD size class.
2. If the start of the FWD transect segment is in a measured condition (see item 1 above) but a portion of the transect segment is not visible due to the presence of snow or standing water, consider the entire transect segment not measurable. In this situation, do not sample anything on

the transect segment--set FWD TRANSECT SEGMENTSAMPLE STATUS code = 0 and record the reason in FWD TRANSECT SEGMENT NONSAMPLED REASON.

3. Only sample FWD that intersects the transect in a plane from the ground to a height of 6 feet.
4. FWD is sampled in three size classes, along transect azimuths described in item 1 above (see section 10.2 for details on transects). Pieces in two FWD size classes (0.01 to 0.24 inches and 0.25 to 0.9 inches) are counted on a 6-foot transect, from 14 to 20 feet horizontal distance. Pieces in the largest size class (1.0 to 2.9 inches) are counted on a 10-foot transect, from 14 to 24 feet. These transects overlap. Note: individual diameters are not recorded for FWD.
5. Count a piece of FWD if it intersects the transect. Be sure to count only woody material such as a twig, branch, wood fragment, or small shrub or tree bole Do not count material that is actually litter, such as pine or fir needles, non-woody parts (e.g., petiole and rachis) of a shrub or tree, etc.
6. Accumulate the number of pieces counted within each size class and enter the total count on one record for the subplot. If there is no tally on a transect, enter zeros for the count. If the transect is not measured (FWD TRANSECT SAMPLE STATUS = 0) the count is null.
7. Accurate counts of FWD can be conducted efficiently up to about 50 pieces for small and medium size classes, and up to 20 pieces for the large size class. After that, crews can begin estimating counts in a systematic fashion. Transects that fall on very dense FWD where counting is nearly impossible, can be sub-sampled and calculated. For example, an accurate count can be conducted on a 2.0-foot section of the transect and then multiplied by 3 to provide an estimate for the 6 foot transect, as long as the crew feels that the remaining transect has a similar density of FWD pieces.
8. If a transect intersects a large pile of material such as a wood rat's nest, recently fallen tree (with many attached fine branches), or a residue pile, crews should estimate a count based on # 7 above, but also enter a code indicating that this is an unusual situation (see section 10.3.7). In the case of a residue pile on the transect, estimate a count by looking at the transect just before and after the pile along with assessing what's inside the pile, and enter a count for the whole transect.
9. If rocks or logs are present along the transect (14- to 24-foot section) include any FWD that is present on top of these things in the respective FWD counts. If the obstructions are so large (huge boulder) that the top surface cannot be seen, assume the count is zero in this area, and continue counting if there is transect line beyond the boulder.
10. If a transect crosses a condition class boundary, record the condition class number and enter a count for each condition on separate records. Transect lengths within each condition class will be obtained from the transect segmenting data entered for the plot.

10.6.1 FWD SUBPLOT NUMBER (BASE)

Record the code indicating the subplot center from which the transect originates.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

10.6.2 FWD TRANSECT (BASE)
Record the azimuth (degrees) of the transect on which FWD is sampled.

Values: degrees

Subplot	Transect direction (degrees) from center of subplot
1	270
2	360
3	135
4	225

10.6.3 FWD CONDITION CLASS NUMBER (BASE)
Record the code indicating the number of the condition class at the start of the transect (14.0 feet horizontal distance from subplot center).

Values: 1 to 9

10.6.4 FWD TRANSECT SEGMENT SAMPLE STATUS (BASE)
Record the sample status for FWD on the transect. There may be situations where the CWD is measurable, but the FWD is hidden from view by snow or water and not measurable. If any part of the FWD transect segment is on a measured condition but the FWD is not measurable, do not count any FWD and set the STATUS code to 0 and the FWD TRANSECT NONSAMPLED REASON code to 10.

In all other situations, set the code to 1. Conditions on which FWD would not be measured regardless (CONDITION CLASS STATUS = 3 or CONDITION CLASS STATUS = 2 AND NONFOREST CONDITION CLASS STATUS = 5) should always be coded 1.

Values:

Value	Description
0	FWD transect segment not sampled
1	FWD transect segment sampled

10.6.5 FWD TRANSECT SEGMENT NONSAMPLED REASON (BASE)
Record the reason that FWD cannot be measured on the transect.

Values:

Value	Description
04	Time Limitation
05	Lost data (office use only)
10	Other (for example, snow or water covering CWD that is supposed to be sampled). “Note required” when using this code.

10.6.6 SMALL FWD COUNT (BASE)
Record the number of pieces counted in this size class (0.01 to 0.24-inch diameter) along the transect segment. An accurate count should be conducted up to 50 pieces. If the count exceeds 50, the transect can be sub-sampled to estimate a total count for the transect length (see 10.6, #8).

Values: 000 to 999 pieces

10.6.7 MEDIUM FWD COUNT (BASE)

Record the number of pieces counted in this size class (0.25 to 0.99-inch diameter) along the transect segment. An accurate count should be conducted up to 50 pieces. If the count exceeds 50, the transect can be sub-sampled to estimate a total count for the transect segment (see 10.6, # 8).

Values: 000 to 999 pieces

10.6.8 LARGE FWD COUNT (BASE)

Record the number of pieces counted in this size class (1.0 to 2.9 inch diameter) along the transect segment. An accurate count should be conducted up to 20 pieces. If the count exceeds 20, the transect can be sub-sampled to estimate a total count for the transect segment (see 10.6, # 8).

Values: 000 to 500 pieces

10.6.9 HIGH COUNT REASON (BASE)

Enter a code that applies to the situation encountered on the transect. Enter a code if any of the counts on the transect are greater than 100 pieces.

Values:

Value	Description
1	High count is due to an overall high density of FWD across the transect
2	Wood Rat's nest located on transect
3	Tree or shrub laying across transect
4	Other reason
5	Residue pile

10.7 DUFF AND LITTER DEPTH MEASUREMENTS

Depth measurements are sampled in accessible forest land conditions (and accessible nonforest conditions, where nonforest conditions are measured). The depth of the duff layer and litter layer are important components of carbon tracking and fire models that estimate fire behavior, fire spread, fire effects, and smoke production. These measurements are taken at the 24-foot location on each transect. If an object such as a rock, log, or residue pile is present at the sample point, depths will be estimated by examining the surface of the object or the area surrounding the object. In the office, an average depth will be calculated and stored with other information about the condition class on the plot.

10.7.1 Definitions

1. Litter is the layer of freshly fallen leaves, needles, twigs (<0.25 inch in diameter), cones, detached bark chunks, dead moss, dead lichens, detached small chunks of rotted wood, dead herbaceous stems, and flower parts (detached and not upright). Litter is the loose plant material found on the top surface of the forest floor which is undecomposed or only partially decomposed organic material. The components of the litter layer can still be readily identified (e.g., plant leaves, twigs, and peat, etc.).

   Litter is flash fuel – so think about it as the loose material that is exposed to the air, capable of igniting quickly and carrying a fire across the surface of the forest floor.

Litter does not include bark that is still attached to a down log, or rotten chunks of wood that are still inside a decaying log or log end (i.e., if a decayed log end has a lot of rotten cubes or pieces laying on a log surface and exposed to air, they are considered part of the log and not litter – fire would burn differently if it hit a pile of rotten punky wood chips cradled by the unrotted sapwood shell). If these rotten chunks have spilled out to the ground and are actually on the ground surface, then they would be included in the litter layer.

Litter does not include animal manure.

2. Duff is the layer just below litter located just above the A-horizon (or uppermost soil mineral horizon). Duff is a dark soil layer dominated by organic material derived from the decomposition of plant and animal litter (pine straw, leaves, twigs, etc.) and deposited on top of an organic or mineral surface. This layer is distinguished from the litter layer in that the original organic material has undergone sufficient decomposition that the source of this material (e.g., individual plant parts) can no longer be identified. You should see no recognizable plant parts. When moss is present, the top of the duff layer is just below the green portion of the moss.

   If peat is present in your part of the country, record it with the duff layer. Peat is an accumulation of partially decayed vegetation matter that forms under conditions of poor drainage such as those found in wetlands or bogs. A layer of peat develops when dead plant material is inhibited from decaying fully because of acidic or anaerobic conditions. In some areas of the U.S. the depth of this layer can be extensive.

10.7.2 Overview of Measurements

Depth measurements will be taken at the 24-foot (horizontal distance) location on each transect. If a log, rock, or residue pile occurs at the sample location, record the depth of the litter on top and below these objects and estimate the duff depth as close to the object as possible. Examine the area around the object to develop an average depth for these layers.

DUFF/LITTER SAMPLE STATUS identifies whether or not the duff and litter depth could be measured or reasonably estimated. Examples of situations where measurement is not possible include the presence of snow or standing water at the sample location. In this case, the STATUS code is set to 0 with the DUFF/LITTER NONSAMPLED REASON code set to 10.

The DUFF AND LITTER METHOD variable has three options for indicating if duff and litter were measured or estimated at each sample location. The default value for this variable is 1, indicating that both depths were measured and recorded. A code of 2 means that litter depth was measured, but duff depth was estimated and a code of 3 indicates that both duff and litter depths were estimated.

Carefully expose a shallow profile of the forest floor by digging out an area at the sample point using a knife, hatchet, or other tool. Estimate the depth of each layer with a ruler to the nearest 0.1 inch. As you dig the hole for this measurement, if you encounter a subsurface rock, root, or buried log – stop the depth measurement at this point. If there is a log, rock, or residue pile on the surface at the sample point, and there appears to be duff and litter under it (or litter on top of it), record a reasonable estimate for each depth. Most likely, the area immediately adjacent to the obstruction will have to be examined to determine an average depth. Depths of zero are perfectly valid: for example if the point falls on bedrock or on top of a log that it resting on mineral soil.

As a general rule, duff depth should rarely exceed a few inches (except when a peat layer is present). Crews should be absolutely sure they are measuring deep duff depths, instead of mineral soil layers or parts of the litter layer. Duff can easily weigh more than 6 times that of litter. If unsure of the bottom of the duff layer, crews should feel the texture of the suspect material in their hand. Rub the soil between your fingers. Does it crumble (duff) or feel more like modeling clay (mineral). If the layer includes a substantial amount of peat, stop the measurement at 2 feet.

The height of the litter should be measured at the top of the loose material located at the sample point on the transect (or nearby if an obstruction exists). Try to preserve the conditions of this location by walking around this point, so the QA staff will measure the same height as the original crew.

10.7.3 DUFF/LITTER SUBPLOT NUMBER (BASE)

Record the code indicating the number of the subplot center from which the transect originates.

Values:

Value	Description
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

10.7.4 DUFF/LITTER TRANSECT (BASE)

Record the azimuth (degrees) of the transect on which duff/litter is sampled.

Values:

Subplot	Transect direction (degrees) from center of subplot
1	090
1	270
2	360
2	180
3	135
3	315
4	045
4	225

10.7.5 DUFF/LITTER CONDITION CLASS NUMBER (BASE)

Record the code indicating the number of the condition class at the sample point (24.0 feet horizontal distance from subplot center)

Values: 1 to 9

10.7.6 DUFF/LITTER SAMPLE STATUS (BASE)

Record the sample status for duff and litter depth on the transect. There may be situations where the CWD is measurable (e.g., shallow depth of snow or water), but the duff and litter are not measurable. If the measurement point is on a measured condition but the duff/litter is not measurable, do not measure duff/litter and set code to 0 with the DUFF/LITTER NONSAMPLED REASON code set to 10.

In all other situations (including where duff and litter depth = 0), set the code to 1. For example, conditions on which duff/litter would not be measured regardless (CONDITION CLASS STATUS = 3 or NONFOREST CONDITION CLASS STATUS = 5) should always be coded 1.

Values:

Value	Description
0	Duff and litter point not sampled
1	Duff and litter point sampled

10.7.7 DUFF/LITTER NONSAMPLED REASON (BASE)

Record the reason that duff/litter cannot be measured on the transect.

Values:

Value	Description
04	Time Limitation
05	Lost data (office use only)
10	Other (for example, snow or water covering measurement point that is supposed to be sampled). “Note required” when using this code

10.7.8 DUFF DEPTH (BASE)

Record the code indicating the depth of the duff layer to the nearest 0.1 inch. Record 24.0 inches when DUFF DEPTH is >24.0 inches and enter Code #4 (Litter depth was measured, duff (peat) depth exceeds 24.0 inches) for 10.9.8 DUFF AND LITTER METHOD.

Values: 00.0 to 24.0 inches

10.7.9 LITTER DEPTH (BASE)

Record the code indicating the depth of the litter layer to the nearest 0.1 inch.

Values: 00.0 to 99.9 inches

10.7.10 DUFF AND LITTER METHOD (BASE)

Record the code indicating whether duff and litter depths were measured or estimated.

Values:

Value	Description
1	Both duff and litter depth were measured
2	Litter depth was measured, duff depth (≤ 24.0 inches) was estimated
3	Both duff and litter depth were estimated
4	Litter depth was measured, duff (peat) depth exceeds 24.0 inches (note required)

10.8 References

Scott, J.E.; Burgan, R.H. 2005. Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model. General Technical Report RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

10.9 Contact Information

Contact information for the National Advisor for this indicator is: Chris Woodall, USDA Forest Service, Northern Research Station, 1992 Folwell Ave, St. Paul, MN 55108, cwoodall@fs.fed.us, http://www.ncrs.fs.fed.us/4801/national-programs/indicators/dwm/ (Note: this web address may be revised in the future. Please visit the Northern Research Station web site for an updated link www.nrs.fs.fed.us .)

APPENDICES

1. State and County, Parish or Borough FIPS Codes

   These are the standard federal 2- and 3-digit codes for States and Counties, Parishes, or Boroughs, respectively.

2. FIA Forest Type Codes

   These are the codes that correspond to the National FIA forest typing algorithm. Units may choose to also add local forest type groupings.

3. FIA Tree Species Codes

   This list includes all species deemed to be tally trees with woodland trees measured for DRC indicated.

4. Was previously: Site Tree Selection Criteria and Species List

5. Determination of Stocking Values for Land Use Classification

6. Glossary

7. Tolerance / MQO / Value / Units Table

8. Tree Coding Guide

9. Invasive Plant List

10. Unknown Plant Specimen Collection

11. Damage Codes

12. Reserved and Administratively Withdrawn Status by Owner and Land Designation

13. Ownership Prefield Procedures

14. Changes in the species code list (appendix 3) beginning in version 9.0 (October, 2019)

Appendix 1. State and County, Parish, or Borough FIPS Codes

(01) Alabama
(001) Autauga
(003) Baldwin
(005) Barbour
(007) Bibb
(009) Blount
(011) Bullock
(013) Butler
(015) Calhoun
(017) Chambers
(019) Cherokee
(021) Chilton
(023) Choctaw
(025) Clarke
(027) Clay
(029) Cleburne
(031) Coffee
(033) Colbert
(035) Conecuh
(037) Coosa
(039) Covington
(041) Crenshaw
(043) Cullman
(045) Dale
(047) Dallas
(049) De Kalb
(051) Elmore
(053) Escambia
(055) Etowah
(057) Fayette
(059) Franklin
(061) Geneva
(063) Greene
(065) Hale
(067) Henry
(069) Houston
(071) Jackson
(073) Jefferson
(075) Lamar
(077) Lauderdale
(079) Lawrence
(081) Lee
(083) Limestone
(085) Lowndes
(087) Macon
(089) Madison
(091) Marengo
(093) Marion
(095) Marshall
(097) Mobile
(099) Monroe
(101) Montgomery
(103) Morgan
(105) Perry
(107) Pickens
(109) Pike
(111) Randolph
(113) Russell
(115) St Clair
(117) Shelby
(119) Sumter
(121) Talladega
(123) Tallapoosa
(125) Tuscaloosa
(127) Walker
(129) Washington
(131) Wilcox
(133) Winston

(02) Alaska
(013) Aleutians East Borough
(016) Aleutians West Census Area
(020) Anchorage Borough
(050) Bethel Census Area
(060) Bristol Bay Borough
(068) Denali Borough
(070) Dillingham Census Area
(090) Fairbanks North Star Borough
(100) Haines Borough
(110) Juneau Borough
(122) Kenai Peninsula Borough
(130) Ketchikan Gateway Borough
(150) Kodiak Island Borough
(164) Lake and Peninsula Borough
(170) Matanuska-Susitna Borough
(180) Nome Census Area
(185) North Slope Borough
(188) Northwest Arctic Borough
(201) Prince of Wales-Outer Ketchikan Census Area
(220) Sitka Borough
(232) Skagway-Hoonah-Angoon Census Area
(240) Southeast Fairbanks Census Area
(261) Valdez-Cordova Census Area
(270) Wade Hampton Census Area
(280) Wrangell-Petersburg Census Area
(282) Yakutat Borough
(290) Yukon-Koyukuk Census Area

(04) Arizona
(001) Apache
(003) Cochise
(005) Coconino
(007) Gila
(009) Graham
(011) Greenlee
(012) La Paz
(013) Maricopa
(015) Mohave
(017) Navajo
(019) Pima
(021) Pinal
(023) Santa Cruz
(025) Yavapai
(027) Yuma

(05) Arkansas
(001) Arkansas
(003) Ashley
(005) Baxter
(007) Benton
(009) Boone
(011) Bradley
(013) Calhoun
(015) Carroll
(017) Chicot
(019) Clark
(021) Clay
(023) Cleburne
(025) Cleveland
(027) Columbia
(029) Conway
(031) Craighead
(033) Crawford
(035) Crittenden
(037) Cross
(039) Dallas
(041) Desha
(043) Drew
(045) Faulkner
(047) Franklin
(049) Fulton
(051) Garland
(053) Grant
(055) Greene
(057) Hempstead
(059) Hot Spring
(061) Howard
(063) Independence
(065) Izard
(067) Jackson
(069) Jefferson
(071) Johnson
(073) Lafayette
(075) Lawrence

(077) Lee
(079) Lincoln
(081) Little River
(083) Logan
(085) Lonoke
(087) Madison
(089) Marion
(091) Miller
(093) Mississippi
(095) Monroe
(097) Montgomery
(099) Nevada
(101) Newton
(103) Ouachita
(105) Perry
(107) Phillips
(109) Pike
(111) Poinsett
(113) Polk
(115) Pope
(117) Prairie
(119) Pulaski
(121) Randolph
(123) St. Francis
(125) Saline
(127) Scott
(129) Searcy
(131) Sebastian
(133) Sevier
(135) Sharp
(137) Stone
(139) Union
(141) Van Buren
(143) Washington
(145) White
(147) Woodruff
(149) Yell

(06) California
(001) Alameda
(003) Alpine
(005) Amador
(007) Butte
(009) Calaveras
(011) Colusa
(013) Contra Costa
(015) Del Norte
(017) El Dorado
(019) Fresno
(021) Glenn
(023) Humboldt
(025) Imperial
(027) Inyo
(029) Kern
(031) Kings
(033) Lake
(035) Lassen
(037) Los Angeles
(039) Madera
(041) Marin
(043) Mariposa
(045) Mendocino
(047) Merced
(049) Modoc
(051) Mono
(053) Monterey
(055) Napa
(057) Nevada
(059) Orange
(061) Placer
(063) Plumas
(065) Riverside
(067) Sacramento
(069) San Benito
(071) San Bernardino
(073) San Diego
(075) San Francisco
(077) San Joaquin
(079) San Luis Obispo
(081) San Mateo
(083) Santa Barbara
(085) Santa Clara
(087) Santa Cruz
(089) Shasta
(091) Sierra
(093) Siskiyou
(095) Solano
(097) Sonoma
(099) Stanislaus
(101) Sutter
(103) Tehama
(105) Trinity
(107) Tulare
(109) Tuolumne
(111) Ventura
(113) Yolo
(115) Yuba

(08) Colorado
(001) Adams
(003) Alamosa
(005) Arapahoe
(007) Archuleta
(009) Baca
(011) Bent
(013) Boulder
(015) Chaffee
(017) Cheyenne
(019) Clear Creek
(021) Conejos
(023) Costilla
(025) Crowley
(027) Custer
(029) Delta
(031) Denver
(033) Dolores
(035) Douglas
(037) Eagle
(039) Elbert
(041) El Paso
(043) Fremont
(045) Garfield
(047) Gilpin
(049) Grand
(051) Gunnison
(053) Hinsdale
(055) Huerfano
(057) Jackson
(059) Jefferson
(061) Kiowa
(063) Kit Carson
(065) Lake
(067) La Plata
(069) Larimer
(071) Las Animas
(073) Lincoln
(075) Logan
(077) Mesa
(079) Mineral
(081) Moffat
(083) Montezuma
(085) Montrose
(087) Morgan
(089) Otero
(091) Ouray
(093) Park
(095) Phillips
(097) Pitkin
(099) Prowers
(101) Pueblo
(103) Rio Blanco
(105) Rio Grande
(107) Routt
(109) Saguache
(111) San Juan
(113) San Miguel
(115) Sedgewick
(117) Summit
(119) Teller
(121) Washington
(123) Weld
(125) Yuma

(09) Connecticut
(001) Fairfield
(003) Hartford
(005) Litchfield
(007) Middlesex

(009) New Haven
(011) New London
(013) Tolland
(015) Windham

(10) Delaware
(001) Kent
(003) New Castle
(005) Sussex

(11) District of Columbia
(001) District of Columbia

(12) Florida
(001) Alachua
(003) Baker
(005) Bay
(007) Bradford
(009) Brevard
(011) Broward
(013) Calhoun
(015) Charlotte
(017) Citrus
(019) Clay
(021) Collier
(023) Columbia
(025) Dade
(027) De Soto
(029) Dixie
(031) Duval
(033) Escambia
(035) Flagler
(037) Franklin
(039) Gadsden
(041) Gilchrist
(043) Glades
(045) Gulf
(047) Hamilton
(049) Hardee
(051) Hendry
(053) Hernando
(055) Highlands
(057) Hillsborough
(059) Holmes
(061) Indian River
(063) Jackson
(065) Jefferson
(067) Lafayette
(069) Lake
(071) Lee
(073) Leon
(075) Levy
(077) Liberty
(079) Madison
(081) Manatee
(083) Marion
(085) Martin
(087) Monroe
(089) Nassau
(091) Okaloosa
(093) Okeechobee
(095) Orange
(097) Osceola
(099) Palm Beach
(101) Pasco
(103) Pinellas
(105) Polk
(107) Putnam
(109) St. Johns
(111) St. Lucie
(113) Santa Rosa
(115) Sarasota
(117) Seminole
(119) Sumter
(121) Suwannee
(123) Taylor
(125) Union
(127) Volusia
(129) Wakulla
(131) Walton
(133) Washington

(13) Georgia
(001) Appling
(003) Atkinston
(005) Bacon
(007) Baker
(009) Baldwin
(011) Banks
(013) Barrow
(015) Bartow
(017) Ben Hill
(019) Berrien
(021) Bibb
(023) Bleckley
(025) Brantley
(027) Brooks
(029) Bryan
(031) Bulloch
(033) Burke
(035) Butts
(037) Calhoun
(039) Camden
(043) Candler
(045) Carroll
(047) Catoosa
(049) Charlton
(051) Chatham
(053) Chattahoochee
(055) Chattooga
(057) Cherokee
(059) Clarke
(061) Clay
(063) Clayton
(065) Clinch
(067) Cobb
(069) Coffee
(071) Colquitt
(073) Columbia
(075) Cook
(077) Coweta
(079) Crawford
(081) Crisp
(083) Dade
(085) Dawson
(087) Decatur
(089) De Kalb
(091) Dodge
(093) Dooly
(095) Dougherty
(097) Douglas
(099) Early
(101) Echols
(103) Effingham
(105) Elbert
(107) Emanuel
(109) Evans
(111) Fannin
(113) Fayette
(115) Floyd
(117) Forsyth
(119) Franklin
(121) Fulton
(123) Gilmer
(125) Glascock
(127) Glynn
(129) Gordon
(131) Grady
(133) Greene
(135) Gwinnett
(137) Habersham
(139) Hall
(141) Hancock
(143) Haralson
(145) Harris
(147) Hart
(149) Heard
(151) Henry
(153) Houston
(155) Irwin
(157) Jackson
(159) Jasper
(161) Jeff Davis
(163) Jefferson
(165) Jenkins
(167) Johnson
(169) Jones
(171) Lamar

(173) Lanier
(175) Laurens
(177) Lee
(179) Liberty
(181) Lincoln
(183) Long
(185) Lowndes
(187) Lumpkin
(189) Mc Duffie
(191) Mc Intosh
(193) Macon
(195) Madison
(197) Marion
(199) Meriwether
(201) Miller
(205) Mitchell
(207) Monroe
(209) Montgomery
(211) Morgan
(213) Murray
(215) Muscogee
(217) Newton
(219) Oconee
(221) Oglethorpe
(223) Paulding
(225) Peach
(227) Pickens
(229) Pierce
(231) Pike
(233) Polk
(235) Pulaski
(237) Putnam
(239) Quitman
(241) Rabun
(243) Randolph
(245) Richmond
(247) Rockdale
(249) Schley
(251) Screven
(253) Seminole
(255) Spalding
(257) Stephens
(259) Stewart
(261) Sumter
(263) Talbot
(265) Taliaferro
(267) Tattnall
(269) Taylor
(271) Telfair
(273) Terrell
(275) Thomas
(277) Tift
(279) Toombs
(281) Towns
(283) Treutlen
(285) Troup
(287) Turner
(289) Twiggs
(291) Union
(293) Upson
(295) Walker
(297) Walton
(299) Ware
(301) Warren
(303) Washington
(305) Wayne
(307) Webster
(309) Wheeler
(311) White
(313) Whitfield
(315) Wilcox
(317) Wilkes
(319) Wilkinson
(321) Worth

(15) Hawaii
(001) Hawaii
(005) Kalawao
(003) Honolulu
(007) Kauai
(009) Maui

(16) Idaho
(001) Ada
(003) Adams
(005) Bannock
(007) Bear Lake
(009) Benewah
(011) Bingham
(013) Blaine
(015) Boise
(017) Bonner
(019) Bonneville
(021) Boundary
(023) Butte
(025) Camas
(027) Canyon
(029) Caribou
(031) Cassia
(033) Clark
(035) Clearwater
(037) Custer
(039) Elmore
(041) Franklin
(043) Fremont
(045) Gem
(047) Gooding
(049) Idaho
(051) Jefferson
(053) Jerome
(055) Kootenai
(057) Latah
(059) Lemhi
(061) Lewis
(063) Lincoln
(065) Madison
(067) Minidoka
(069) Nez Perce
(071) Oneida
(073) Owyhee
(075) Payette
(077) Power
(079) Shoshone
(081) Teton
(083) Twin Falls
(085) Valley
(087) Washington
(089) Yellowstone National Park

(17) Illinois
(001) Adams
(003) Alexander
(005) Bond
(007) Boone
(009) Brown
(011) Bureau
(013) Calhoun
(015) Carroll
(017) Cass
(019) Champaign
(021) Christian
(023) Clark
(025) Clay
(027) Clinton
(029) Coles
(031) Cook
(033) Crawford
(035) Cumberland
(037) DeKalb
(039) De Witt
(041) Douglas
(043) DuPage
(045) Edgar
(047) Edwards
(049) Effingham
(051) Fayette
(053) Ford
(055) Franklin
(057) Fulton
(059) Gallatin
(061) Greene
(063) Grundy
(065) Hamilton
(067) Hancock
(069) Hardin
(071) Henderson
(073) Henry

(075) Iroquois
(077) Jackson
(079) Jasper
(081) Jefferson
(083) Jersey
(085) Jo Daviess
(087) Johnson
(089) Kane
(091) Kankakee
(093) Kendall
(095) Knox
(097) Lake
(099) La Salle
(101) Lawrence
(103) Lee
(105) Livingston
(107) Logan
(109) McDonough
(111) McHenry
(113) McLean
(115) Macon
(117) Macoupin
(119) Madison
(121) Marion
(123) Marshall
(125) Mason
(127) Massac
(129) Menard
(131) Mercer
(133) Monroe
(135) Montgomery
(137) Morgan
(139) Moultrie
(141) Ogle
(143) Peoria
(145) Perry
(147) Piatt
(149) Pike
(151) Pope
(153) Pulaski
(155) Putnam
(157) Randolph
(159) Richland
(161) Rock Island
(163) St. Clair
(165) Saline
(167) Sangamon
(169) Schuyler
(171) Scott
(173) Shelby
(175) Stark
(177) Stephenson
(179) Tazewell
(181) Union
(183) Vermilion
(185) Wabash
(187) Warren
(189) Washington
(191) Wayne
(193) White
(195) Whiteside
(197) Will
(199) Williamson
(201) Winnebago
(203) Woodford

(18) Indiana
(001) Adams
(003) Allen
(005) Bartholomew
(007) Benton
(009) Blackford
(011) Boone
(013) Brown
(015) Carroll
(017) Cass
(019) Clark
(021) Clay
(023) Clinton
(025) Crawford
(027) Daviess
(033) De Kalb
(029) Dearborn
(031) Decatur
(035) Delaware
(037) Dubois
(039) Elkhart
(041) Fayette
(043) Floyd
(045) Fountain
(047) Franklin
(049) Fulton
(051) Gibson
(053) Grant
(055) Greene
(057) Hamilton
(059) Hancock
(061) Harrison
(063) Hendricks
(065) Henry
(067) Howard
(069) Huntington
(071) Jackson
(073) Jasper
(075) Jay
(077) Jefferson
(079) Jennings
(081) Johnson
(083) Knox
(085) Kosciusko
(087) Lagrange
(089) Lake
(091) La Porte
(093) Lawrence
(095) Madison
(097) Marion
(099) Marshall
(101) Martin
(103) Miami
(105) Monroe
(107) Montgomery
(109) Morgan
(111) Newton
(113) Noble
(115) Ohio
(117) Orange
(119) Owen
(121) Parke
(123) Perry
(125) Pike
(127) Porter
(129) Posey
(131) Pulaski
(133) Putnam
(135) Randolph
(137) Ripley
(139) Rush
(143) Scott
(145) Shelby
(147) Spencer
(141) St. Joseph
(149) Starke
(151) Steuben
(153) Sullivan
(155) Switzerland
(157) Tippecanoe
(159) Tipton
(161) Union
(163) Vanderburgh
(165) Vermillion
(167) Vigo
(169) Wabash
(171) Warren
(173) Warrick
(175) Washington
(177) Wayne
(179) Wells
(181) White
(183) Whitley

(19) Iowa
(001) Adair
(003) Adams
(005) Allamakee
(007) Appanoose
(009) Audubon
(011) Benton
(013) Black Hawk

(015) Boone
(017) Bremer
(019) Buchanan
(021) Buena Vista
(023) Butler
(025) Calhoun
(027) Carroll
(029) Cass
(031) Cedar
(033) Cerro Gordo
(035) Cherokee
(037) Chickasaw
(039) Clarke
(041) Clay
(043) Clayton
(045) Clinton
(047) Crawford
(049) Dallas
(051) Davis
(053) Decatur
(055) Delaware
(057) Des Moines
(059) Dickinson
(061) Dubuque
(063) Emmet
(065) Fayette
(067) Floyd
(069) Franklin
(071) Fremont
(073) Greene
(075) Grundy
(077) Guthrie
(079) Hamilton
(081) Hancock
(083) Hardin
(085) Harrison
(087) Henry
(089) Howard
(091) Humboldt
(093) Ida
(095) Iowa
(097) Jackson
(099) Jasper
(101) Jefferson
(103) Johnson
(105) Jones
(107) Keokuk
(109) Kossuth
(111) Lee
(113) Linn
(115) Louisa
(117) Lucas
(119) Lyon
(121) Madison
(123) Mahaska
(125) Marion
(127) Marshall
(129) Mills
(131) Mitchell
(133) Monona
(135) Monroe
(137) Montgomery
(139) Muscatine
(141) O'Brien
(143) Osceola
(145) Page
(147) Palo Alto
(149) Plymouth
(151) Pocahontas
(153) Polk
(155) Pottawattamie
(157) Poweshiek
(159) Ringgold
(161) Sac
(163) Scott
(165) Shelby
(167) Sioux
(169) Story
(171) Tama
(173) Taylor
(175) Union
(177) Van Buren
(179) Wapello
(181) Warren
(183) Washington
(185) Wayne
(187) Webster
(189) Winnebago
(191) Winneshiek
(193) Woodbury
(195) Worth
(197) Wright

(20) Kansas
(001) Allen
(003) Anderson
(005) Atchison
(007) Barber
(009) Barton
(011) Bourbon
(013) Brown
(015) Butler
(017) Chase
(019) Chautauqua
(021) Cherokee
(023) Cheyenne
(025) Clark
(027) Clay
(029) Cloud
(031) Coffey
(033) Comanche
(035) Cowley
(037) Crawford
(039) Decatur
(041) Dickinson
(043) Doniphan
(045) Douglas
(047) Edwards
(049) Elk
(051) Ellis
(053) Ellsworth
(055) Finney
(057) Ford
(059) Franklin
(061) Geary
(063) Gove
(065) Graham
(067) Grant
(069) Gray
(071) Greeley
(073) Greenwood
(075) Hamilton
(077) Harper
(079) Harvey
(081) Haskell
(083) Hodgeman
(085) Jackson
(087) Jefferson
(089) Jewell
(091) Johnson
(093) Kearny
(095) Kingman
(097) Kiowa
(099) Labette
(101) Lane
(103) Leavenworth
(105) Lincoln
(107) Linn
(109) Logan
(111) Lyon
(113) McPherson
(115) Marion
(117) Marshall
(119) Meade
(121) Miami
(123) Mitchell
(125) Montgomery
(127) Morris
(129) Morton
(131) Nemaha
(133) Neosho
(135) Ness
(137) Norton
(139) Osage
(141) Osborne
(143) Ottawa
(145) Pawnee
(147) Phillips

(149) Pottawatomie
(151) Pratt
(153) Rawlins
(155) Reno
(157) Republic
(159) Rice
(161) Riley
(163) Rooks
(165) Rush
(167) Russell
(169) Saline
(171) Scott
(173) Sedgwick
(175) Seward
(177) Shawnee
(179) Sheridan
(181) Sherman
(183) Smith
(185) Stafford
(187) Stanton
(189) Stevens
(191) Sumner
(193) Thomas
(195) Trego
(197) Wabaunsee
(199) Wallace
(201) Washington
(203) Wichita
(205) Wilson
(207) Woodson
(209) Wyandotte

(21) Kentucky
(001) Adair
(003) Allen
(005) Anderson
(007) Ballard
(009) Barren
(011) Bath
(013) Bell
(015) Boone
(017) Bourbon
(019) Boyd
(021) Boyle
(023) Bracken
(025) Breathitt
(027) Breckinridge
(029) Bullitt
(031) Butler
(033) Caldwell
(035) Calloway
(037) Campbell
(039) Carlisle
(041) Carroll
(043) Carter
(045) Casey
(047) Christian
(049) Clark
(051) Clay
(053) Clinton
(055) Crittenden
(057) Cumberland
(059) Daviess
(061) Edmonson
(063) Elliott
(065) Estill
(067) Fayette
(069) Fleming
(071) Floyd
(073) Franklin
(075) Fulton
(077) Gallatin
(079) Garrard
(081) Grant
(083) Graves
(085) Grayson
(087) Green
(089) Greenup
(091) Hancock
(093) Hardin
(095) Harlan
(097) Harrison
(099) Hart
(101) Henderson
(103) Henry
(105) Hickman
(107) Hopkins
(109) Jackson
(111) Jefferson
(113) Jessamine
(115) Johnson
(117) Kenton
(119) Knott
(121) Knox
(123) Larue
(125) Laurel
(127) Lawrence
(129) Lee
(131) Leslie
(133) Letcher
(135) Lewis
(137) Lincoln
(139) Livingston
(141) Logan
(143) Lyon
(145) McCracken
(147) McCreary
(149) McLean
(151) Madison
(153) Magoffin
(155) Marion
(157) Marshall
(159) Martin
(161) Mason
(163) Meade
(165) Menifee
(167) Mercer
(169) Metcalfe
(171) Monroe
(173) Montgomery
(175) Morgan
(177) Muhlenberg
(179) Nelson
(181) Nicholas
(183) Ohio
(185) Oldham
(187) Owen
(189) Owsley
(191) Pendleton
(193) Perry
(195) Pike
(197) Powell
(199) Pulaski
(201) Robertson
(203) Rockcastle
(205) Rowan
(207) Russell
(209) Scott
(211) Shelby
(213) Simpson
(215) Spencer
(217) Taylor
(219) Todd
(221) Trigg
(223) Trimble
(225) Union
(227) Warren
(229) Washington
(231) Wayne
(233) Webster
(235) Whitley
(237) Wolfe
(239) Woodford

(22) Louisiana
(001) Acadia
(003) Allen
(005) Ascension
(007) Assumption
(009) Avoyelles
(011) Beauregard
(013) Bienville
(015) Bossier
(017) Caddo
(019) Calcasieu
(021) Caldwell
(023) Cameron
(025) Catahoula

(027) Claiborne
(029) Concordia
(031) De Soto
(033) East Baton Rouge
(035) East Carroll
(037) East Feliciana
(039) Evangeline
(041) Franklin
(043) Grant
(045) Iberia
(047) Iberville
(049) Jackson
(051) Jefferson
(053) Jefferson Davis
(055) Lafayette
(057) LaFourche
(059) La Salle
(061) Lincoln
(063) Livingston
(065) Madison
(067) Morehouse
(069) Natchitoches
(071) Orleans
(073) Ouachita
(075) Plaquemines
(077) Pointe Coupee
(079) Rapides
(081) Red River
(083) Richland
(085) Sabine
(087) St. Bernard
(089) St. Charles
(091) St. Helena
(093) St. James
(095) St. John the Baptist
(097) St. Landry
(099) St. Martin
(101) St. Mary
(103) St. Tammany
(105) Tangipahoa
(107) Tensas
(109) Terrebonne
(111) Union
(113) Vermilion
(115) Vernon
(117) Washington
(119) Webster
(121) West Baton Rouge
(123) West Carroll
(125) West Feliciana
(127) Winn

(23) Maine
(001) Androscoggin
(003) Aroostook
(005) Cumberland
(007) Franklin
(009) Hancock
(011) Kennebec
(013) Knox
(015) Lincoln
(017) Oxford
(019) Penobscot
(021) Piscataquis
(023) Sagadahoc
(025) Somerset
(027) Waldo
(029) Washington
(031) York

(24) Maryland
(100) Allegany
(003) Anne Arundel
(005) Baltimore
(009) Calvert
(011) Caroline
(013) Carroll
(015) Cecil
(017) Charles
(019) Dorchester
(021) Frederick
(023) Garrett
(025) Harford
(027) Howard
(029) Kent
(031) Montgomery
(033) Prince Georges
(035) Queen Annes
(037) St. Marys
(039) Somerset
(041) Talbot
(043) Washington
(045) Wicomico
(047) Worcester
(510) Baltimore City

(25) Massachusetts
(001) Barnstable
(003) Berkshire
(005) Bristol
(007) Dukes
(009) Essex
(011) Franklin
(013) Hampden
(015) Hampshire
(017) Middlesex
(019) Nantucket
(021) Norfolk
(023) Plymouth
(025) Suffolk
(027) Worcester
(029) Washington
(031) York

(26) Michigan
(001) Alcona
(003) Alger
(005) Allegan
(007) Alpena
(009) Antrim
(011) Arenac
(013) Baraga
(015) Barry
(017) Bay
(019) Benzie
(021) Berrien
(023) Branch
(025) Calhoun
(027) Cass
(029) Charlevoix
(031) Cheboygan
(033) Chippewa
(035) Clare
(037) Clinton
(039) Crawford
(041) Delta
(043) Dickinson
(045) Eaton
(047) Emmet
(049) Genesee
(051) Gladwin
(053) Gogebic
(055) Grand Traverse
(057) Gratiot
(059) Hillsdale
(061) Houghton
(063) Huron
(065) Ingham
(067) Ionia
(069) Iosco
(071) Iron
(073) Isabella
(075) Jackson
(077) Kalamazoo
(079) Kalkaska
(081) Kent
(083) Keweenaw
(085) Lake
(087) Lapeer
(089) Leelanau
(091) Lenawee
(093) Livingston
(095) Luce
(097) Mackinac
(099) Macomb
(101) Manistee
(103) Marquette
(105) Mason

(107) Mecosta
(109) Menominee
(111) Midland
(113) Missaukee
(115) Monroe
(117) Montcalm
(119) Montmorency
(121) Muskegon
(123) Newaygo
(125) Oakland
(127) Oceana
(129) Ogemaw
(131) Ontonagon
(133) Osceola
(135) Oscoda
(137) Otsego
(139) Ottawa
(141) Presque Isle
(143) Roscommon
(145) Saginaw
(147) St. Clair
(149) St. Joseph
(151) Sanilac
(153) Schoolcraft
(155) Shiawassee
(157) Tuscola
(159) Van Buren
(161) Washtenaw
(163) Wayne
(165) Wexford

(27) Minnesota
(001) Aitkin
(003) Anoka
(005) Becker
(007) Beltrami
(009) Benton
(011) Big Stone
(013) Blue Earth
(015) Brown
(017) Carlton
(019) Carver
(021) Cass
(023) Chippewa
(025) Chisago
(027) Clay
(029) Clearwater
(031) Cook
(033) Cottonwood
(035) Crow Wing
(037) Dakota
(039) Dodge
(041) Douglas
(043) Faribault
(045) Fillmore
(047) Freeborn
(049) Goodhue
(051) Grant
(053) Hennepin
(055) Houston
(057) Hubbard
(059) Isanti
(061) Itasca
(063) Jackson
(065) Kanabec
(067) Kandiyohi
(069) Kittson
(071) Koochiching
(073) Lac qui Parle
(075) Lake
(077) Lake of the Woods
(079) Le Sueur
(081) Lincoln
(083) Lyon
(085) McLeod
(087) Mahnomen
(089) Marshall
(091) Martin
(093) Meeker
(095) Mille Lacs
(097) Morrison
(099) Mower
(101) Murray
(103) Nicollet
(105) Nobles
(107) Norman
(109) Olmsted
(111) Otter Tail
(113) Pennington
(115) Pine
(117) Pipestone
(119) Polk
(121) Pope
(123) Ramsey
(125) Red Lake
(127) Redwood
(129) Renville
(131) Rice
(133) Rock
(135) Roseau
(137) St. Louis
(139) Scott
(141) Sherburne
(143) Sibley
(145) Stearns
(147) Steele
(149) Stevens
(151) Swift
(153) Todd
(155) Traverse
(157) Wabasha
(159) Wadena
(161) Waseca
(163) Washington
(165) Watonwan
(167) Wilkin
(169) Winona
(171) Wright
(173) Yellow Medicine

(28) Mississippi
(001) Adams
(003) Alcorn
(005) Amite
(007) Attala
(009) Benton
(011) Bolivar
(013) Calhoun
(015) Carroll
(017) Chickasaw
(019) Choctaw
(021) Claiborne
(023) Clarke
(025) Clay
(027) Coahoma
(029) Copiah
(031) Covington
(033) De Soto
(035) Forrest
(037) Franklin
(039) George
(041) Greene
(043) Grenada
(045) Hancock
(047) Harrison
(049) Hinds
(051) Holmes
(053) Humphreys
(055) Issaquena
(057) Itawamba
(059) Jackson
(061) Jasper
(063) Jefferson
(065) Jefferson Davis
(067) Jones
(069) Kemper
(071) Lafayette
(073) Lamar
(075) Lauderdale
(077) Lawrence
(079) Leake
(081) Lee
(083) Leflore
(085) Lincoln
(087) Lowndes
(089) Madison
(091) Marion
(093) Marshall

(095) Monroe
(097) Montgomery
(099) Neshoba
(101) Newton
(103) Noxubee
(105) Oktibbeha
(107) Panola
(109) Pearl River
(111) Perry
(113) Pike
(115) Pontotoc
(117) Prentiss
(119) Quitman
(121) Rankin
(123) Scott
(125) Sharkey
(127) Simpson
(129) Smith
(131) Stone
(133) Sunflower
(135) Tallahatchie
(137) Tate
(139) Tippah
(141) Tishomingo
(143) Tunica
(145) Union
(147) Walthall
(149) Warren
(151) Washington
(153) Wayne
(155) Webster
(157) Wilkinson
(159) Winston
(161) Yalobusha
(163) Yazoo

(29) Missouri
(001) Adair
(003) Andrew
(005) Atchison
(007) Audrain
(009) Barry
(011) Barton
(013) Bates
(015) Benton
(017) Bollinger
(019) Boone
(021) Buchanan
(023) Butler
(025) Caldwell
(027) Callaway
(029) Camden
(031) Cape Girardeau
(033) Carroll
(035) Carter
(037) Cass
(039) Cedar
(041) Chariton
(043) Christian
(045) Clark
(047) Clay
(049) Clinton
(051) Cole
(053) Cooper
(055) Crawford
(057) Dade
(059) Dallas
(061) Daviess
(063) De Kalb
(065) Dent
(067) Douglas
(069) Dunklin
(071) Franklin
(073) Gasconade
(075) Gentry
(077) Greene
(079) Grundy
(081) Harrison
(083) Henry
(085) Hickory
(087) Holt
(089) Howard
(091) Howell
(093) Iron
(095) Jackson
(097) Jasper
(099) Jefferson
(101) Johnson
(103) Knox
(105) Laclede
(107) Lafayette
(109) Lawrence
(111) Lewis
(113) Lincoln
(115) Linn
(117) Livingston
(119) McDonald
(121) Macon
(123) Madison
(125) Maries
(127) Marion
(129) Mercer
(131) Miller
(133) Mississippi
(135) Moniteau
(137) Monroe
(139) Montgomery
(141) Morgan
(143) New Madrid
(145) Newton
(147) Nodaway
(149) Oregon
(151) Osage
(153) Ozark
(155) Pemiscot
(157) Perry
(159) Pettis
(161) Phelps
(163) Pike
(165) Platte
(167) Polk
(169) Pulaski
(171) Putnam
(173) Ralls
(175) Randolph
(177) Ray
(179) Reynolds
(181) Ripley
(183) St. Charles
(185) St. Clair
(186) Ste. Genevieve
(187) St. Francois
(189) St. Louis
(195) Saline
(197) Schuyler
(199) Scotland
(201) Scott
(203) Shannon
(205) Shelby
(207) Stoddard
(209) Stone
(211) Sullivan
(213) Taney
(215) Texas
(217) Vernon
(219) Warren
(221) Washington
(223) Wayne
(225) Webster
(227) Worth
(229) Wright
(510) St. Louis City

(30) Montana
(001) Beaverhead
(003) Big Horn
(005) Blaine
(007) Broadwater
(009) Carbon
(011) Carter
(013) Cascade
(015) Chouteau
(017) Custer
(019) Daniels
(021) Dawson
(023) Deer Lodge
(025) Fallon
(027) Fergus

(029) Flathead
(031) Gallatin
(033) Garfield
(035) Glacier
(037) Golden Valley
(039) Granite
(041) Hill
(043) Jefferson
(045) Judith Basin
(047) Lake
(049) Lewis and Clark
(051) Liberty
(053) Lincoln
(055) McCone
(057) Madison
(059) Meagher
(061) Mineral
(063) Missoula
(065) Musselshell
(067) Park
(069) Petroleum
(071) Phillips
(073) Pondera
(075) Powder River
(077) Powell
(079) Prairie
(081) Ravalli
(083) Richland
(085) Roosevelt
(087) Rosebud
(089) Sanders
(091) Sheridan
(093) Silver Bow
(095) Stillwater
(097) Sweet Grass
(099) Teton
(101) Toole
(103) Treasure
(105) Valley
(107) Wheatland
(109) Wibaux
(111) Yellowstone
(113) Yellowstone National Park

(31) Nebraska
(001) Adams
(003) Antelope
(005) Arthur
(007) Banner
(009) Blaine
(011) Boone
(013) Box Butte
(015) Boyd
(017) Brown
(019) Buffalo
(021) Burt
(023) Butler
(025) Cass
(027) Cedar
(029) Chase
(031) Cherry
(033) Cheyenne
(035) Clay
(037) Colfax
(039) Cuming
(041) Custer
(043) Dakota
(045) Dawes
(047) Dawson
(049) Deuel
(051) Dixon
(053) Dodge
(055) Douglas
(057) Dundy
(059) Fillmore
(061) Franklin
(063) Frontier
(065) Furnas
(067) Gage
(069) Garden
(071) Garfield
(073) Gosper
(075) Grant
(077) Greeley
(079) Hall
(081) Hamilton
(083) Harlan
(085) Hayes
(087) Hitchcock
(089) Holt
(091) Hooker
(093) Howard
(095) Jefferson
(097) Johnson
(099) Kearney
(101) Keith
(103) Keya Paha
(105) Kimball
(107) Knox
(109) Lancaster
(111) Lincoln
(113) Logan
(115) Loup
(117) McPherson
(119) Madison
(121) Merrick
(123) Morrill
(125) Nance
(127) Nemaha
(129) Nuckolls
(131) Otoe
(133) Pawnee
(135) Perkins
(137) Phelps
(139) Pierce
(141) Platte
(143) Polk
(145) Red Willow
(147) Richardson
(149) Rock
(151) Saline
(153) Sarpy
(155) Saunders
(157) Scotts Bluff
(159) Seward
(161) Sheridan
(163) Sherman
(165) Sioux
(167) Stanton
(169) Thayer
(171) Thomas
(173) Thurston
(175) Valley
(177) Washington
(179) Wayne
(181) Webster
(183) Wheeler
(185) York

(32) Nevada
(001) Churchill
(003) Clark
(005) Douglas
(007) Elko
(009) Esmeralda
(011) Eureka
(013) Humboldt
(015) Lander
(017) Lincoln
(019) Lyon
(021) Mineral
(023) Nye
(027) Pershing
(029) Storey
(031) Washoe
(033) White Pine
(510) Carson City

(33) New Hampshire
(001) Belknap
(003) Carroll
(007) Coos
(005) Cheshire
(009) Grafton
(011) Hillsborough
(013) Merrimack
(015) Rockingham

(017) Strafford
(019) Sullivan

(34) New Jersey
(001) Atlantic
(003) Bergen
(005) Burlington
(007) Camden
(009) Cape May
(011) Cumberland
(013) Essex
(015) Gloucester
(017) Hudson
(019) Hunterdon
(021) Mercer
(023) Middlesex
(025) Monmouth
(027) Morris
(029) Ocean
(031) Passaic
(033) Salem
(035) Somerset
(037) Sussex
(039) Union
(041) Warren

(35) New Mexico
(001) Bernalillo
(003) Catron
(005) Chaves
(006) Cibola
(007) Colfax
(009) Curry
(011) De Baca
(013) Dona Ana
(015) Eddy
(017) Grant
(019) Guadalupe
(021) Harding
(023) Hidalgo
(025) Lea
(027) Lincoln
(028) Los Alamos
(029) Luna
(031) McKinley
(033) Mora
(035) Otero
(037) Quay
(039) Rio Arriba
(041) Roosevelt
(043) Sandoval
(045) San Juan
(047) San Miguel
(049) Santa Fe
(051) Sierra
(053) Socorro
(055) Taos
(057) Torrance
(059) Union
(061) Valencia

(36) New York
(001) Albany
(003) Allegany
(005) Bronx
(007) Broome
(009) Cattaraugus
(011) Cayuga
(013) Chautauqua
(015) Chemung
(017) Chenango
(019) Clinton
(021) Columbia
(023) Cortland
(025) Delaware
(027) Dutchess
(029) Erie
(031) Essex
(033) Franklin
(035) Fulton
(037) Genesee
(039) Greene
(041) Hamilton
(043) Herkimer
(045) Jefferson
(047) Kings
(049) Lewis
(051) Livingston
(053) Madison
(055) Monroe
(057) Montgomery
(059) Nassau
(061) New York
(063) Niagara
(065) Oneida
(067) Onondaga
(069) Ontario
(071) Orange
(073) Orleans
(075) Oswego
(077) Otsego
(079) Putnam
(081) Queens
(083) Rensselaer
(085) Richmond
(087) Rockland
(089) St. Lawrence
(091) Saratoga
(093) Schenectady
(095) Schoharie
(097) Schuyler
(099) Seneca
(101) Steuben
(103) Suffolk
(105) Sullivan
(107) Tioga
(109) Tompkins
(111) Ulster
(113) Warren
(115) Washington
(117) Wayne
(119) Westchester
(121) Wyoming
(123) Yates

(37) North Carolina
(001) Alamance
(003) Alexander
(005) Alleghany
(007) Anson
(009) Ashe
(011) Avery
(013) Beaufort
(015) Bertie
(017) Bladen
(019) Brunswick
(021) Buncombe
(023) Burke
(025) Cabarrus
(027) Caldwell
(029) Camden
(031) Carteret
(033) Caswell
(035) Catawba
(037) Chatham
(039) Cherokee
(041) Chowan
(043) Clay
(045) Cleveland
(047) Columbus
(049) Craven
(051) Cumberland
(053) Currituck
(055) Dare
(057) Davidson
(059) Davie
(061) Duplin
(063) Durham
(065) Edgecombe
(067) Forsyth
(069) Franklin
(071) Gaston
(073) Gates
(075) Graham
(077) Granville
(079) Greene
(081) Guilford
(083) Halifax

(085) Harnett
(087) Haywood
(089) Henderson
(091) Hertford
(093) Hoke
(095) Hyde
(097) Iredell
(099) Jackson
(101) Johnston
(103 Jones
(105) Lee
(107) Lenoir
(109) Lincoln
(111) McDowell
(113) Macon
(115) Madison
(117) Martin
(119) Mecklenburg
(121) Mitchell
(123) Montgomery
(125) Moore
(127) Nash
(129) New Hanover
(131) Northhampton
(133) Onslow
(135) Orange
(137) Pamlico
(139) Pasquotank
(141) Pender
(143) Perquimans
(145) Person
(147) Pitt
(149) Polk
(151) Randolph
(153) Richmond
(155) Robeson
(157) Rockingham
(159) Rowan
(161) Rutherford
(163) Sampson
(165) Scotland
(167) Stanly
(169) Stokes
(171) Surry
(173) Swain
(175) Transylvania
(177) Tyrrell
(179) Union
(181) Vance
(183) Wake
(185) Warren
(187) Washington
(189) Watauga
(191) Wayne
(193) Wilkes
(195) Wilson
(197) Yadkin
(199) Yancey

(38) North Dakota
(001) Adams
(003) Barnes
(005) Benson
(007) Billings
(009) Bottineau
(011) Bowman
(013) Burke
(015) Burleigh
(017) Cass
(019) Cavalier
(021) Dickey
(023) Divide
(025) Dunn
(027) Eddy
(029) Emmons
(031) Foster
(033) Golden Valley
(035) Grand Forks
(037) Grant
(039) Griggs
(041) Hettinger
(043) Kidder
(045) La Moure
(047) Logan
(049) McHenry
(051) McIntosh
(053) McKenzie
(055) McLean
(057) Mercer
(059) Morton
(061) Mountrial
(063) Nelson
(065) Oliver
(067) Pembina
(069) Pierce
(071) Ramsey
(073) Ransom
(075) Renville
(077) Richland
(079) Rolette
(081) Sargent
(083) Sheridan
(085) Sioux
(087) Slope
(089) Stark
(091) Steele
(093) Stutsman
(095) Towner
(097) Traill
(099) Walsh
(101) Ward
(103) Wells
(105) Williams

(39) Ohio
(001) Adams
(003) Allen
(005) Ashland
(007) Ashtabula
(009) Athens
(011) Auglaize
(013) Belmont
(015) Brown
(017) Butler
(019) Carroll
(021) Champaign
(023) Clark
(025) Clermont
(027) Clinton
(029) Columbiana
(031) Coshocton
(033) Crawford
(035) Cuyahoga
(037) Darke
(039) Defiance
(041) Delaware
(043) Erie
(045) Fairfield
(047) Fayette
(049) Franklin
(051) Fulton
(053) Gallia
(055) Geauga
(057) Greene
(059) Guernsey
(061) Hamilton
(063) Hancock
(065) Hardin
(067) Harrison
(069) Henry
(071) Highland
(073) Hocking
(075) Holmes
(077) Huron
(079) Jackson
(081) Jefferson
(083) Knox
(085) Lake
(087) Lawrence
(089) Licking
(091) Logan
(093) Lorain
(095) Lucas
(097) Madison
(099) Mahoning
(101) Marion
(103) Medina
(105) Meigs

(107) Mercer
(109) Miami
(111) Monroe
(113) Montgomery
(115) Morgan
(117) Morrow
(119) Muskingum
(121) Noble
(123) Ottawa
(125) Paulding
(127) Perry
(129) Pickaway
(131) Pike
(133) Portage
(135) Preble
(137) Putnam
(139) Richland
(141) Ross
(143) Sandusky
(145) Scioto
(147) Seneca
(149) Shelby
(151) Stark
(153) Summit
(155) Trumbull
(157) Tuscarawas
(159) Union
(161) Van Wert
(163) Vinton
(165) Warren
(167) Washington
(169) Wayne
(171) Williams
(173) Wood
(175) Wyandot

(40) Oklahoma
(001) Adair
(003) Alfalfa
(005) Atoka
(007) Beaver
(009) Beckham
(011) Blaine
(013) Bryan
(015) Caddo
(017) Canadian
(019) Carter
(021) Cherokee
(023) Choctaw
(025) Cimarron
(027) Cleveland
(029) Coal
(031) Comanche
(033) Cotton
(035) Craig
(037) Creek
(039) Custer
(041) Delaware
(043) Dewey
(045) Ellis
(047) Garfield
(049) Garvin
(051) Grady
(053) Grant
(055) Greer
(057) Harmon
(059) Harper
(061) Haskell
(063) Hughes
(065) Jackson
(067) Jefferson
(069) Johnston
(071) Kay
(073) Kingfisher
(075) Kiowa
(077) Latimer
(079) Le Flore
(081) Lincoln
(083) Logan
(085) Love
(087) McClain
(089) McCurtain
(091) McIntosh
(093) Major
(095) Marshall
(097) Mayes
(099) Murray
(101) Muskogee
(103) Noble
(105) Nowata
(107) Okfuskee
(109) Oklahoma
(111) Okmulgee
(113) Osage
(115) Ottawa
(117) Pawnee
(119) Payne
(121) Pittsburg
(123) Pontotoc
(125) Pottawatomie
(127) Pushmataha
(129) Roger Mills
(131) Rogers
(133) Seminole
(135) Sequoyah
(137) Stephens
(139) Texas
(141) Tillman
(143) Tulsa
(145) Wagoner
(147) Washington
(149) Washita
(151) Woods
(153) Woodward

(41) Oregon
(001) Baker
(003) Benton
(005) Clackamas
(007) Clatsop
(009) Columbia
(011) Coos
(013) Crook
(015) Curry
(017) Deschutes
(019) Douglas
(021) Gilliam
(023) Grant
(025) Harney
(027) Hood River
(029) Jackson
(031) Jefferson
(033) Josephine
(035) Klamath
(037) Lake
(039) Lane
(041) Lincoln
(043) Linn
(045) Malheur
(047) Marion
(049) Morrow
(051) Multnomah
(053) Polk
(055) Sherman
(057) Tillamook
(059) Umatilla
(061) Union
(063) Wallowa
(065) Wasco
(067) Washington
(069) Wheeler
(071) Yamhill

(42) Pennsylvania
(001) Adams
(003) Allegheny
(005) Armstrong
(007) Beaver
(009) Bedford
(011) Berks
(013) Blair
(015) Bradford
(017) Bucks
(019) Butler
(021) Cambria
(023) Cameron
(025) Carbon
(027) Centre

(029) Chester
(031) Clarion
(033) Clearfield
(035) Clinton
(037) Columbia
(039) Crawford
(041) Cumberland
(043) Dauphin
(045) Delaware
(047) Elk
(049) Erie
(051) Fayette
(053) Forest
(055) Franklin
(057) Fulton
(059) Greene
(061) Huntingdon
(063) Indiana
(065) Jefferson
(067) Juniata
(069) Lackawanna
(071) Lancaster
(073) Lawrence
(075) Lebanon
(077) Lehigh
(079) Luzerne
(081) Lycoming
(083) McKean
(085) Mercer
(087) Mifflin
(089) Monroe
(091) Montgomery
(093) Montour
(095) Northampton
(097) Northumberland
(099) Perry
(101) Philadelphia
(103) Pike
(105) Potter
(107) Schuylkill
(109) Snyder
(111) Somerset
(113) Sullivan
(115) Susquehanna
(117) Tioga
(119) Union
(121) Venango
(123) Warren
(125) Washington
(127) Wayne
(129) Westmoreland
(131) Wyoming
(133) York
(447) Elk-Anf
(453) Forest-Anf
(483) McKean-Anf
(523) Warren-Anf

(44) Rhode Island
(001) Bristol
(003) Kent
(005) Newport
(007) Providence
(009) Washington

(45) South Carolina
(001) Abbeville
(003) Aiken
(005) Allendale
(007) Anderson
(009) Bamberg
(011) Barnwell
(013) Beaufort
(015) Berkeley
(017) Calhoun
(019) Charleston
(021) Cherokee
(023) Chester
(025) Chesterfield
(027) Clarendon
(029) Colleton
(031) Darlington
(033) Dillon
(035) Dorchester
(037) Edgefield
(039) Fairfield
(041) Florence
(043) Georgetown
(045) Greenville
(047) Greenwood
(049) Hampton
(051) Horry
(053) Jasper
(055) Kershaw
(057) Lancaster
(059) Laurens
(061) Lee
(063) Lexington
(065) Mc Cormick
(067) Marion
(069) Marlboro
(071) Newberry
(073) Oconee
(075) Orangeburg
(077) Pickens
(079) Richland
(081) Saluda
(083) Spartanburg
(085) Sumter
(087) Union
(089) Williamsburg
(091) York

(46) South Dakota
(003) Aurora
(005) Beadle
(007) Bennett
(009) Bon Homme
(011) Brookings
(013) Brown
(015) Brule
(017) Buffalo
(019) Butte
(021) Campbell
(023) Charles Mix
(025) Clark
(027) Clay
(029) Codington
(031) Corson
(033) Custer
(035) Davison
(037) Day
(039) Deuel
(041) Dewey
(043) Douglas
(045) Edmunds
(047) Fall River
(049) Faulk
(051) Grant
(053) Gregory
(055) Haakon
(057) Hamlin
(059) Hand
(061) Hanson
(063) Harding
(065) Hughes
(067) Hutchinson
(069) Hyde
(071) Jackson
(073) Jerauld
(075) Jones
(077) Kingsbury
(079) Lake
(081) Lawrence
(083) Lincoln
(085) Lyman
(087) McCook
(089) McPherson
(091) Marshall
(093) Meade
(095) Mellette
(097) Miner
(099) Minnehaha
(101) Moody
(103) Pennington
(105) Perkins
(107) Potter
(109) Roberts

(111) Sanborn
(113) Shannon
(115) Spink
(117) Stanley
(119) Sully
(121) Todd
(123) Tripp
(125) Turner
(127) Union
(129) Walworth
(135 Yankton
(137) Ziebach

(47) Tennessee
(001) Anderson
(003) Bedford
(005) Benton
(007) Bledsoe
(009) Blount
(011) Bradley
(013) Campbell
(015) Cannon
(017) Carroll
(019) Carter
(021) Cheatham
(023) Chester
(025) Claiborne
(027) Clay
(029) Cocke
(031) Coffee
(033) Crockett
(035) Cumberland
(037) Davidson
(039) Decatur
(041) De Kalb
(043) Dickson
(045) Dyer
(047) Fayette
(049) Fentress
(051) Franklin
(053) Gibson
(055) Giles
(057) Grainger
(059) Greene
(061) Grundy
(063) Hamblen
(065) Hamilton
(067) Hancock
(069) Hardeman
(071) Hardin
(073) Hawkins
(075) Haywood
(077) Henderson
(079) Henry
(081) Hickman
(083) Houston
(085) Humphreys
(087) Jackson
(089) Jefferson
(091) Johnson
(093) Knox
(095) Lake
(097) Lauderdale
(099) Lawrence
(101) Lewis
(103) Lincoln
(105) Loudon
(107) Mc Minn
(109) Mc Nairy
(111) Macon
(113) Madison
(115) Marion
(117) Marshall
(119) Maury
(121) Meigs
(123) Monroe
(125) Montgomery
(127) Moore
(129) Morgan
(131) Obion
(133) Overton
(135) Perry
(137) Pickett
(139) Polk
(141) Putnam
(143) Rhea
(145) Roane
(147) Robertson
(149) Rutherford
(151) Scott
(153) Sequatchie
(155) Sevier
(157) Shelby
(159) Smith
(161) Stewart
(163) Sullivan
(165) Sumner
(167) Tipton
(169) Trousdale
(171) Unicoi
(173) Union
(175) Van Buren
(177) Warren
(179) Washington
(181) Wayne
(183) Weakley
(185) White
(187) Williamson
(189) Wilson

(48) Texas
(001) Anderson
(003) Andrews
(005) Angelina
(007) Aransas
(009) Archer
(011) Armstrong
(013) Atascosa
(015) Austin
(017) Bailey
(019) Bandera
(021) Bastrop
(023) Baylor
(025) Bee
(027) Bell
(029) Bexar
(031) Blanco
(033) Borden
(035) Bosque
(037) Bowie
(039) Brazoria
(041) Brazos
(043) Brewster
(045) Briscoe
(047) Brooks
(049) Brown
(051) Burleston
(053) Burnet
(055) Caldwell
(057) Calhoun
(059) Callahan
(061) Cameron
(063) Camp
(065) Carson
(067) Cass
(069) Castro
(071) Chambers
(073) Cherokee
(075) Childress
(077) Clay
(079) Cochran
(081) Coke
(083) Coleman
(085) Collin
(087) Collingsworth
(089) Colorado
(091) Comal
(093) Comanche
(095) Concho
(097) Cooke
(099) Coryell
(101) Cottle
(103) Crane
(105) Crockett
(107) Crosby
(109) Culberson
(111) Dallam
(113) Dallas

(115) Dawson
(117) Deaf Smith
(119) Delta
(121) Denton
(123) De Witt
(125) Dickens
(127) Dimmit
(129) Donley
(131) Duval
(133) Eastland
(135) Ector
(137) Edwards
(139) Ellis
(141) El Paso
(143) Erath
(145) Falls
(147) Fannin
(149) Fayette
(151) Fisher
(153) Floyd
(155) Foard
(157) Fort Bend
(159) Franklin
(161) Freestone
(163) Frio
(165) Gaines
(167) Galveston
(169) Garza
(171) Gillespie
(173) Glasscock
(175) Goliad
(177) Gonzales
(179) Gray
(181) Grayson
(183) Gregg
(185) Grimes
(187) Guadalupe
(189) Hale
(191) Hall
(193) Hamilton
(195) Hansford
(197) Hardeman
(199) Hardin
(201) Harris
(203) Harrison
(205) Hartley
(207) Haskell
(209) Hays
(211) Hemphill
(213) Henderson
(215) Hidalgo
(217) Hill
(219) Hockley
(221) Hood
(223) Hopkins
(225) Houston
(227) Howard
(229) Hudspeth
(231) Hunt
(233) Hutchinson
(235) Irion
(237) Jack
(239) Jackson
(241) Jasper
(243) Jeff Davis
(245) Jefferson
(247) Jim Hogg
(249) Jim Wells
(251) Johnson
(253) Jones
(255) Karnes
(257) Kaufman
(259) Kendall
(261) Kenedy
(263) Kent
(265) Kerr
(267) Kimble
(269) King
(271) Kinney
(273) Kleberg
(275) Knox
(277) Lamar
(279) Lamb
(281) Lampasas
(283) La Salle
(285) Lavaca
(287) Lee
(289) Leon
(291) Liberty
(293) Limestone
(295) Lipscomb
(297) Live Oak
(299) Llano
(301) Loving
(303) Lubbock
(305) Lynn
(307) McCulloch
(309) McLennan
(311) McMullen
(313) Madison
(315) Marion
(317) Martin
(319) Mason
(321) Matagorda
(323) Maverick
(325) Medina
(327) Menard
(329) Midland
(331) Milam
(333) Mills
(335) Mitchell
(337) Montague
(339) Montgomery
(341) Moore
(343) Morris
(345) Motley
(347) Nacogdoches
(349) Navarro
(351) Newton
(353) Nolan
(355) Nueces
(357) Ochiltree
(359) Oldham
(361) Orange
(363) Palo Pinto
(365) Panola
(367) Parker
(369) Parmer
(371) Pecos
(373) Polk
(375) Potter
(377) Presidio
(379) Rains
(381) Randall
(383) Reagan
(385) Real
(387) Red River
(389) Reeves
(391) Refugio
(393) Roberts
(395) Robertson
(397) Rockwall
(399) Runnels
(401) Rusk
(403) Sabine
(405) San Augustine
(407) San Jacinto
(409) San Patricio
(411) San Saba
(413) Schleicher
(415) Scurry
(417) Shackelford
(419) Shelby
(421) Sherman
(423) Smith
(425) Somervell
(427) Starr
(429) Stephens
(431) Sterling
(433) Stonewall
(435) Sutton
(437) Swisher
(439) Tarrant
(441) Taylor
(443) Terrell
(445) Terry
(447) Throckmorton
(449) Titus

(451) Tom Green
(453) Travis
(455) Trinity
(457) Tyler
(459) Upshur
(461) Upton
(463) Uvalde
(465) Val Verde
(467) Van Zandt
(469) Victoria
(471) Walker
(473) Waller
(475) Ward
(477) Washington
(479) Webb
(481) Wharton
(483) Wheeler
(485) Wichita
(487) Wilbarger
(489) Willacy
(491) Williamson
(493) Wilson
(495) Winkler
(497) Wise
(499) Wood
(501) Yoakum
(503) Young
(505) Zapata
(507) Zavala

(49) Utah
(001) Beaver
(003) Box Elder
(005) Cache
(007) Carbon
(009) Daggett
(011) Davis
(013) Duchesne
(015) Emery
(017) Garfield
(019) Grand
(021) Iron
(023) Juab
(025) Kane
(027) Millard
(029) Morgan
(031) Piute
(033) Rich
(035) Salt Lake
(037) San Juan
(039) Sanpete
(041) Sevier
(043) Summit
(045) Tooele
(047) Uintah
(049) Utah
(051) Wasatch
(053) Washington
(055) Wayne
(057) Weber

(50) Vermont
(001) Addison
(003) Bennington
(005) Caledonia
(007) Chittenden
(009) Essex
(011) Franklin
(013) Grand Isle
(015) Lamoille
(017) Orange
(019) Orleans
(021) Rutland
(023) Washington
(025) Windham
(027) Windsor

(51) Virginia
(001) Accomack
(003) Albemarle
(005) Alleghany
(007) Amelia
(009) Amherst
(011) Appomattox
(013) Arlington
(015) Augusta
(017) Bath
(019) Bedford
(021) Bland
(023) Botetourt
(025) Brunswick
(027) Buchanan
(029) Buckingham
(031) Campbell
(033) Caroline
(035) Carroll
(036) Charles City
(037) Charlotte
(041) Chesterfield
(043) Clarke
(045) Craig
(047) Culpeper
(049) Cumberland
(051) Dickenson
(053) Dinwiddie
(057) Essex
(059) Fairfax
(061) Fauquier
(063) Floyd
(065) Fluvanna
(067) Franklin
(069) Frederick
(071) Giles
(073) Gloucester
(075) Goochland
(077) Grayson
(079) Greene
(081) Greensville
(083) Halifax
(085) Hanover
(087) Henrico
(089) Henry
(091) Highland
(093) Isle of Wight
(095) James City
(097) King and Queen
(099) King George
(101) King William
(103) Lancaster
(105) Lee
(107) Loudoun
(109) Louisa
(111) Lunenberg
(113) Madison
(115) Mathews
(117) Mecklenburg
(119) Middlesex
(121) Montgomery
(125) Nelson
(127) New Kent
(131) Northampton
(133) Northumberland
(135) Nottoway
(137) Orange
(139) Page
(141) Patrick
(143) Pittsylvania
(145) Powhatan
(147) Prince Edward
(149) Prince George
(153) Prince William
(155) Pulaski
(157) Rappahannock
(159) Richmond
(161) Roanoke
(163) Rockbridge
(165) Rockingham
(167) Russell
(169) Scott
(171) Shenandoah
(173) Smyth
(175) Southampton
(177) Spotsylvania
(179) Stafford
(181) Surry
(183) Sussex
(185) Tazewell
(187) Warren

(191) Washington
(193) Westmoreland
(195) Wise
(197) Wythe
(199) York
(510) Alexandria City
(515) Bedford City
(520) Bristol City
(530) Buena Vista City
(540) Charlottesville City
(550) Chesapeake City
(560) Clifton Gorge City
(570) Colonial Heights City
(580) Covington City
(590) Danville City
(595) Emporia City
(600) Fairfax City
(610) Falls Church City
(620) Franklin City
(630) Fredericksburg City
(640) Galax City
(650) Hampton City
(660) Harrisonburg City
(670) Hopewell City
(678) Lexington City
(680) Lynchburg City
(683) Manassas City
(685) Manassas Park
(690) Martinsville City
(700) Newport News City
(710) Norfolk City
(720) Norton City
(730) Petersburg City
(735) Poquoson
(740) Portsmouth City
(750) Radford City
(760) Richmond City
(770) Roanoke City
(775) Salem City
(780) South Boston City
(790) Staunton City
(800) Suffolk City
(810) Virginia Beach City
(820) Waynesboro City
(830) Williamsburg City
(840) Winchester City

(53) Washington
(001) Adams
(003) Asotin
(005) Benton
(007) Chelan
(009) Clallam
(011) Clark
(013) Columbia
(015) Cowlitz
(017) Douglas
(019) Ferry
(021) Franklin
(023) Garfield
(025) Grant
(027) Grays Harbor
(029) Island
(031) Jefferson
(033) King
(035) Kitsap
(037) Kittitas
(039) Klickitat
(041) Lewis
(043) Lincoln
(045) Mason
(047) Okanogan
(049) Pacific
(051) Pend Oreille
(053) Pierce
(055) San Juan
(057) Skagit
(059) Skamania
(061) Snohomish
(063) Spokane
(065) Stevens
(067) Thurston
(069) Wahkiakum
(071) Walla Walla
(073) Whatcom
(075) Whitman
(077) Yakima

(54) West Virginia
(001) Barbour
(003) Berkeley
(005) Boone
(007) Braxton
(009) Brooke
(011) Cabell
(013) Calhoun
(015) Clay
(017) Doddridge
(019) Fayette
(021) Gilmer
(023) Grant
(025) Greenbriar
(027) Hampshire
(029) Hancock
(031) Hardy
(033) Harrison
(035) Jackson
(037) Jefferson
(039) Kanawha
(041) Lewis
(043) Lincoln
(045) Logan
(049) Marion
(051) Marshall
(053) Mason
(047) McDowell
(055) Mercer
(057) Mineral
(059) Mingo
(065) Morgan
(061) Monongalia
(063) Monroe
(067) Nicholas
(069) Ohio
(071) Pendleton
(073) Pleasant
(075) Pocahontas
(077) Preston
(079) Putnam
(081) Raleigh
(083) Randolph
(085) Ritchie
(087) Roane
(089) Summers
(091) Taylor
(093) Tucker
(095) Tyler
(097) Upshur
(099) Wayne
(101) Webster
(103) Wetzel
(105) Wirt
(107) Wood
(109) Wyoming

(55) Wisconsin
(001) Adams
(003) Ashland
(005) Barron
(007) Bayfield
(009) Brown
(011) Buffalo
(013) Burnett
(015) Calumet
(017) Chippewa
(019) Clark
(021) Columbia
(023) Crawford
(025) Dane
(027) Dodge
(029) Door
(031) Douglas
(033) Dunn
(035) Eau Claire
(037) Florence
(039) Fond du Lac
(041) Forest
(043) Grant

(045) Green
(047) Green Lake
(049) Iowa
(051) Iron
(053) Jackson
(055) Jefferson
(057) Juneau
(059) Kenosha
(061) Kewaunee
(063) La Crosse
(065) Lafayette
(067) Langlade
(069) Lincoln
(071) Manitowoc
(073) Marathon
(075) Marinette
(077) Marquette
(078) Menominee
(079) Milwaukee
(081) Monroe
(083) Oconto
(085) Oneida
(087) Outagamie
(089) Ozaukee
(091) Pepin
(093) Pierce
(095) Polk
(097) Portage
(099) Price
(101) Racine
(103) Richland
(105) Rock
(107) Rusk
(109) St. Croix
(111) Sauk
(113) Sawyer
(115) Shawano
(117) Sheboygan
(119) Taylor
(121) Trempealeau
(123) Vernon
(125) Vilas
(127) Walworth
(129) Washburn
(131) Washington
(133) Waukesha
(135) Waupaca
(137) Waushara
(139) Winnebago
(141) Wood

(56) Wyoming
(001) Albany
(003) Big Horn
(005) Campbell
(007) Carbon
(009) Converse
(011) Crook
(013) Fremont
(015) Goshen
(017) Hot Springs
(019) Johnson
(021) Laramie
(023) Lincoln
(025) Natrona
(027) Niobrara
(029) Park
(031) Platte
(033) Sheridan
(035) Sublette
(037) Sweetwater
(039) Teton
(041) Uinta
(043) Washakie
(045) Weston

(60) American Samoa
(010) Tutuila East
(020) Manu'a
(030) Rose
(040) Swains
(050) Tutuila West

(64) Federated States of Micronesia
(002) Chuuk
(005) Kosrae
(040) Pohnpei
(060) Yap

(66) Guam
(010) Guam

(68) Marshall Islands
(007) Ailinginae
(010) Ailinglaplap
(030) Ailuk
(040) Arno
(050) Aur
(060) Bikar
(070) Bikini
(073) Bokak
(080) Ebon
(090) Enewetak
(100) Erikub
(110_ Jabat
(120) Jaluit
(130) Jemo
(140) Kili
(150) Kwajalein
(160) Lae
(170) Lib
(180) Likiep
(190) Majuro
(300) Maloelap
(310) Mejit
(320) Mili
(330) Namorik
(340) Namu
(350) Rongelap
(360) Rongrik
(385) Toke
(390) Ujae
(400) Ujelang
(410) Utrik
(420) Wotho
(430) Wotje

(69) Northern Mariana Islands
(085) Northern Islands
(100) Rota
(110) Saipan
(120) Tinian

70 Palau
(002) Aimeliik
(004) Airai
(010) Angaur
(050) Hatoboheit
(100) Kayangel
(150) Koror
(212) Melekeok
(214) Ngaraard
(218) Ngarchelong
(222) Ngardmau
(224) Ngatpang
(226) Ngchesar
(227) Ngernmlengui
(228) Ngiwal
(350) Peleliu
(370) Sonsorol

(72) Puerto Rico
(001) Adjuntas
(003) Aguada
(005) Aguadilla
(007) Aguas Buenas
(009) Aibonito
(011) Anasco
(013) Arecibo
(015) Arroyo
(017) Barceloneta
(019) Barranquitas
(021) Bayamon
(023) Cabo Rojo
(025) Caguas
(027) Camuy

(029) Canovanas
(031) Carolina
(033) Catano
(035) Cayey
(037) Ceiba
(039) Ciales
(041) Cidra
(043) Coamo
(045) Comerio
(047) Corozal
(049) Culebra
(051) Dorado
(053) Fajardo
(054) Florida
(055) Guanica
(057) Guayama
(059) Guayanilla
(061) Guaynabo
(063) Gurabo
(065) Hatillo
(067) Hormigueros
(069) Humacao
(071) Isabela Municipio
(073) Jayuya
(075) Juana Diaz
(077) Juncos
(079) Lajas
(081) Lares
(083) Las Marias
(085) Las Piedras
(087) Loiza
(089) Luquillo
(091) Manati
(093) Maricao
(095) Maunabo
(097) Mayaguez
(099) Moca
(101) Morovis
(103) Naguabo
(105) Naranjito
(107) Orocovis
(109) Patillas
(111) Penuelas
(113) Ponce
(115) Quebradillas
(117) Rincon
(119) Rio Grande
(121) Sabana Grande
(123) Salinas
(125) San German
(127) San Juan
(129) San Lorenzo
(131) San Sebastian
(133) Santa Isabel
(135) Toa Alta
(137) Toa Baja
(139) Trujillo Alto
(141) Utuado
(143) Vega Alta
(145) Vega Baja
(147) Vieques
(149) Villalba
(151) Yabucoa
(153) Yuaco

(78) U.S. Virgin Islands
(010) St. Croix Island
(020) St. John Island
(030) St. Thomas Island

Appendix 2. FIA Forest Type Codes

This following list includes all forest types in the Continental U.S. and Alaska Types designated East/West are commonly found in those regions, although types designated for one region may occasionally be found in another.

East	West	Code	Species Type
			White / Red / Jack Pine Group
E		101	Jack pine
E		102	Red pine
E		103	Eastern white pine
E		104	Eastern white pine / eastern hemlock
E		105	Eastern hemlock
			Spruce / Fir Group
E		121	Balsam fir
E		122	White spruce
E		123	Red spruce
E		124	Red spruce / balsam fir
E	W	125	Black spruce
E		126	Tamarack
E		127	Northern white-cedar
E		128	Fraser fir
E		129	Red spruce / Fraser fir
			Longleaf / Slash Pine Group
E		141	Longleaf pine
E		142	Slash pine
			Tropical Softwoods Group
E		151	Tropical pines
			Loblolly / Shortleaf Pine Group
E		161	Loblolly pine
E		162	Shortleaf pine
E		163	Virginia pine
E		164	Sand pine
E		165	Table-mountain pine
E		166	Pond pine
E		167	Pitch pine
E		168	Spruce pine
			Other Eastern Softwoods Group
E		171	Eastern redcedar
E		172	Florida softwoods
			Pinyon / Juniper Group
E	W	182	Rocky Mountain juniper
E	W	184	Juniper woodland
E	W	185	Pinyon-juniper woodland
			Douglas-fir Group
E	W	201	Douglas-fir
	W	202	Port-Orford-cedar

East	West	Code	Species Type
	W	203	Bigcone Douglas-fir
			Ponderosa Pine Group
E	W	221	Ponderosa pine
	W	222	Incense-cedar
	W	224	Sugar pine
	W	225	Jeffrey pine
	W	226	Coulter pine
			Western White Pine Group
	W	241	Western white pine
			Fir / Spruce / Mountain Hemlock Group
	W	261	White fir
	W	262	Red fir
	W	263	Noble fir
	W	264	Pacific silver fir
	W	265	Engelmann spruce
	W	266	Engelmann spruce / subalpine fir
	W	267	Grand fir
	W	268	Subalpine fir
	W	269	Blue spruce
	W	270	Mountain hemlock
	W	271	Alaska-yellow-cedar
			Lodgepole Pine Group
	W	281	Lodgepole pine
			Hemlock / Sitka Spruce Group
	W	301	Western hemlock
	W	304	Western redcedar
	W	305	Sitka spruce
			Western Larch Group
	W	321	Western larch
			Redwood Group
	W	341	Redwood
	W	342	Giant sequoia
			Other Western Softwoods Group
	W	361	Knobcone pine
	W	362	Southwestern white pine
	W	363	Bishop pine
	W	364	Monterey pine
	W	365	Foxtail pine / bristlecone pine
	W	366	Limber pine
	W	367	Whitebark pine
	W	368	Misc. western softwoods
	W	369	Western juniper
			California Mixed Conifer Group
	W	371	California mixed conifer

East	West	Code	Species Type
			Exotic Softwoods Group
E		381	Scotch pine
E	W	383	Other exotic softwoods
E		384	Norway spruce
E		385	Introduced larch
			Other Softwoods Group
		391	Other softwoods
			Oak / Pine Group
E		401	Eastern white pine / N. red oak / white ash
E		402	Eastern redcedar / hardwood
E		403	Longleaf pine / oak
E		404	Shortleaf pine / oak
E		405	Virginia pine / southern red oak
E		406	Loblolly pine / hardwood
E		407	Slash pine / hardwood
E		409	Other pine / hardwood
			Oak / Hickory Group
E		501	Post oak / blackjack oak
E		502	Chestnut oak
E		503	White oak / red oak / hickory
E		504	White oak
E		505	Northern red oak
E		506	Yellow-poplar / white oak / N. red oak
E		507	Sassafras / persimmon
E		508	Sweetgum / yellow-poplar
E		509	Bur oak
E		510	Scarlet oak
E		511	Yellow-poplar
E		512	Black walnut
E		513	Black locust
E		514	Southern scrub oak
E		515	Chestnut oak / black oak / scarlet oak
E		516	Cherry / white ash / yellow-poplar
E		517	Elm / ash / black locust
E		519	Red maple / oak
E		520	Mixed upland hardwoods
			Oak / Gum / Cypress Group
E		601	Swamp chestnut oak / cherrybark oak
E		602	Sweetgum / Nuttall oak / willow oak
E		605	Overcup oak / water hickory
E		606	Atlantic white-cedar
E		607	Baldcypress / water tupelo
E		608	Sweetbay / swamp tupelo / red maple
E		609	Baldcypress / pondcypress
			Elm / Ash / Cottonwood Group
E		701	Black ash / American elm / red maple
E		702	River birch / sycamore
E	W	703	Cottonwood

East	West	Code	Species Type
E	W	704	Willow
E		705	Sycamore / pecan / American elm
E		706	Sugarberry / hackberry / elm / green ash
E		707	Silver maple / American elm
E		708	Red maple / lowland
E	W	709	Cottonwood / willow
	W	722	Oregon ash
			Maple / Beech / Birch Group
E		801	Sugar maple / beech / yellow birch
E		802	Black cherry
E		805	Hard maple / basswood
E		809	Red maple / upland
			Aspen / Birch Group
E	W	901	Aspen
E	W	902	Paper birch
E		903	Gray birch
E	W	904	Balsam poplar
E	W	905	Pin cherry
			Alder / Maple Group
	W	911	Red alder
	W	912	Bigleaf maple
			Western Oak Group
	W	921	Gray pine
	W	922	California black oak
	W	923	Oregon white oak
	W	924	Blue oak
	W	931	Coast live oak
	W	933	Canyon live oak
	W	934	Interior live oak
	W	935	California white oak (valley oak)
			Tanoak / Laurel Group
	W	941	Tanoak
	W	942	California laurel
	W	943	Giant chinkapin
			Other Hardwoods Group
	W	961	Pacific madrone
	W	962	Other hardwoods
			Woodland Hardwoods Group
	W	971	Deciduous oak woodland
	W	972	Evergreen oak woodland
	W	973	Mesquite woodland
	W	974	Cercocarpus (Mountain brush) woodland
	W	975	Intermountain maple woodland
	W	976	Misc. woodland hardwoods
			Tropical Hardwoods Group
E		982	Mangrove

East	West	Code	Species Type
E	W	983	Palms
		984	Dry forest
		985	Moist forest
		986	Wet and rain forest
		987	Lower montane wet and rain forest
		988	Cloud forest
E		989	Other tropical hardwoods
			Exotic Hardwoods Group
E		991	Paulownia
E		992	Melaleuca
E	W	993	Eucalyptus
E	W	995	Other exotic hardwoods

For nonstocked stands, see section 2.5.3 for procedures to determine FOREST TYPE.

Unless otherwise stated, forest types are named for the predominant species (or group of species) on the condition. In order to determine if the type should be classified as softwood versus hardwood, first estimate the stocking (site occupancy) of trees in each of these two categories. If softwoods predominate (50% or more), then the forest type will be one of the softwood types (codes 101 through 391) and vice versa for hardwoods (codes 401 through 995).

For the Eastern United States, there are mixed hardwood-pine forest types (codes 401 through 409) when the pine and/or redcedar (either eastern or southern) component is between 25 and 49% of the stocking. If the pine/redcedar component is less than 25% of the stocking, then one of the hardwood forest types is assigned.

WHITE/RED/JACK PINE GROUP
In these pure pine forest types, stocking of the pine component needs to be at least 50 percent. Otherwise, check the forest types listed under the Oak / Pine Group (beginning with forest type code (401).

101 Jack pine: Associates – northern pin oak, bur oak, red pine, bigtooth aspen, paper birch, northern red oak, eastern white pine, red maple, balsam fir, white spruce, black spruce, and tamarack. Sites -- Dry to mesic sites.

102 Red pine: Associates – eastern white pine, jack pine, red maple, northern red oak, white spruce, balsam fir, quaking aspen, bigtooth aspen, paper birch, northern pin oak. Sites -- common on sandy soils, but reaches best development on well-drained sandy loam to loam soils.

103 Eastern white pine: Associates – pitch pine, gray birch, aspen, red maple, pin cherry, white oak, paper birch, sweet birch, yellow birch, black cherry, white ash, northern red oak, sugar maple, basswood, hemlock, northern white-cedar, yellow-poplar, white oak, chestnut oak, scarlet oak, and shortleaf pine. Sites -- wide variety, but best development on well drained sands and sandy loams.

104 Eastern white pine/ eastern hemlock (includes Carolina hemlock): Associates – beech, sugar maple, basswood, red maple, yellow birch, gray birch, red spruce, balsam fir, black cherry, white ash, paper birch, sweet birch, northern red oak, white oak, chestnut oak, yellow-poplar, and cucumbertree. Sites -- wide variety but favors cool locations, moist ravines, and north slopes.

105 Eastern hemlock (includes Carolina hemlock): Associates – white pine, balsam fir, red spruce, beech, sugar maple, yellow birch, basswood, red maple, black cherry, white ash, paper birch, sweet

birch, northern red oak, and white oak. Sites -- cool locations, moist ravines, and north and east slopes.

SPRUCE/FIR GROUP
These types are mostly in the Eastern United States. See FIR/SPRUCE/MOUNTAIN HEMLOCK for Western United States.

121 Balsam fir: Associates – black, white, or red spruce; paper or yellow birch; quaking or bigtooth aspen, beech; red maple; hemlock; tamarack; black ash; or northern white-cedar. Sites -- upland sites on low-lying moist flats and in swamps.

122 White spruce: Associates – black spruce, paper birch, quaking aspen, red spruce, balsam fir, and balsam poplar. Sites -- Transcontinental; grows well on calcareous and well-drained soils, but is found on acidic rocky and sandy sites, and sometimes in fen peatlands along the maritime coast.

123 Red spruce: Associates – vary widely and may include red maple, yellow birch, eastern hemlock, eastern white pine, white spruce, northern white-cedar, paper birch, pin cherry, gray birch, mountain-ash, beech, striped maple, sugar maple, northern red oak, red pine, and aspen. Sites -- include moderately well-drained to poorly drained flats and thin slopes and on varying acidic soils in abandoned fields and pastures. This code should be used where red spruce comprises a plurality or majority of the stand's stocking but where balsam fir is either nonexistent or has very little stocking (< 5 percent of total). Otherwise the plot would be coded 124, red spruce/balsam fir.

124 Red spruce/balsam fir: Associates – red maple, paper birch, white pine, hemlock, white spruce, and northern white-cedar. Sites -- moderately drained to poorly drained flats or on thin-soiled upper slopes.

125 Black spruce: Associates – white spruce, quaking aspen, balsam fir, paper birch, tamarack, northern white-cedar, black ash, and red maple. Sites -- wide variety from moderately dry to very wet.

126 Tamarack: Associates – black spruce, balsam fir, white spruce, northern white-cedar, and quaking aspen. Sites -- found on wetlands and poorly drained sites.

127 Northern white-cedar: Associates – balsam fir, tamarack, black spruce, white spruce, red spruce, black ash, and red maple. Sites -- mainly occurs in swamps, but also in seepage areas, limestone uplands and old fields.

128 Fraser fir: Associates – red spruce, hemlock, yellow birch, less frequently, beech, sugar maple, yellow buckeye, mountain-ash, and mountain maple. Sites -- mainly occurs in the Appalachian Mountains of North Carolina and Tennessee. This type is used if the stocking of Fraser fir is at least 50 percent of the total stocking.

129 Red spruce/Fraser fir: Associates – hemlock, yellow birch, and less frequently, beech, sugar maple, yellow buckeye, mountain-ash, and mountain maple. Sites -- mainly occurs in the Appalachian Mountains of North Carolina and Tennessee. For this type to be used, the sum of the stocking of red spruce and Fraser fir must be at least 50 percent of the total stocking and red spruce stocking must be between 5 and 49 percent of total and Fraser fir stocking must be between 5 and 49 percent of total.

LONGLEAF/SLASH PINE GROUP

141 Longleaf pine: Longleaf pine occurs as a pure type or comprises a majority of the trees in the overstory. Associates-slash, loblolly and shortleaf pine, southern red oak, blackjack oak, water oak, persimmon, and sweetgum. Sites - -those areas that can and do burn on a periodic basis--usually

occurs on middle and upper slopes with a low severity of hardwood and brush competition. SRS distribution--coastal plain and piedmont units.

142 Slash pine: Slash pine is pure or provides a majority of the stocking. Associates--on moist sites; a wide variety of moist-site hardwoods, pond pine, and pondcypress. On dry sites; a wide variety of dry-site hardwoods, longleaf, loblolly, and sand pine. Sites -- both moist and well-drained flatwoods, and bays. SRS distribution--coastal plain and piedmont units from North Carolina to Florida.

TROPICAL SOFTWOODS GROUP

151 Tropical pines: Tropical pine forests and plantations comprised of Caribbean pine (*Pinus caribea*). Associates are *P. oocarpa*, *P. patula* and other pine species native to the Florida Keys, Caribbean, Central America and Mexico. Pines are not native to Puerto Rico or the U.S. Virgin Islands but can be found in plantations or naturally regenerating to a limited extent on sites that were formerly plantations. *P. caribea* was once rare on the South Florida mainland, but practically non-existent there now and it is not used in plantations in Florida.

LOBLOLLY/SHORTLEAF PINE GROUP

161 Loblolly pine: Associates – sweetgum, southern red oak, post oak, blackjack oak, blackgum, yellow-poplar, and pond pine. Sites -- upland soils with abundant moisture but good drainage, and on poorly drained depressions.

162 Shortleaf pine: Associates – white oak, southern red oak, scarlet oak, black oak, hickory, post oak, blackjack oak, blackgum, red maple, pitch pine, and Virginia pine. Sites -- low, well drained ridges to rocky, dry, south slopes and the better drained spur ridges on north slopes and also on old fields.

163 Virginia pine: Associates – shortleaf pine, white oak, chestnut oak, southern red oak, black oak, sweetgum, red maple, blackgum, and pitch pine. Sites--dry sites, often abandoned fields.

164 Sand pine: Sand pine occurs in pure stands or provides a majority of the stocking. Associates--dwarf live oak, dwarf post oak, turkey oak, persimmon, and longleaf pine. Sites -- dry, acidic, infertile sands. SRS distribution--found chiefly in the central peninsula and panhandle of Florida, although planted stands extend into the sandhills of Georgia and South Carolina.

165 Table-mountain pine: Associates – chestnut oak, scarlet oak, pitch pine, and black oak. Sites -- poor, dry, often rocky slopes.

166 Pond pine: Associates – loblolly pine, sweetgum, baldcypress, and Atlantic white-cedar. Sites -- rare, but found in southern New Jersey, Delaware, and Maryland in low, poorly drained acres, swamps, and marshes.

167 Pitch pine: Associates – chestnut oak, scarlet oak, table-mountain pine, black oak, and blackgum. Sites -- relatively infertile ridges, dry flats, and slopes.

168 Spruce pine: Spruce pine comprises a majority of the stocking. Associates--any of the moist site softwood or hardwood species. Sites - -moist or poorly drained areas. SRS distribution--this type is rarely encountered and is found almost exclusively in the coastal plain.

OTHER EASTERN SOFTWOODS GROUP

171 Eastern redcedar (includes southern redcedar): Associates – gray birch, red maple, sweet birch, Virginia Pine, shortleaf pine, oak. Sites -- usually dry uplands and abandoned fields on limestone outcrops and other shallow soils but can grow well on good sites.

172 Florida softwoods (includes either Florida yew or Florida torreya): Either of these two species comprises the majority of stocking. Sites -- Along bluffs and ravines of the Apalachicola River and its tributaries in north Florida and South Georgia.

PINYON / JUNIPER GROUP

182 Rocky Mountain juniper: Rocky Mountain juniper comprises the majority of stocking. Associates – ponderosa pine, Douglas-fir, other junipers, pinyons, and oaks. Sites -- often found on calcareous and somewhat alkaline soils.

184 Juniper woodland: Includes Pinchot juniper, redberry juniper, Ashe juniper, California juniper, alligator juniper, Utah juniper, oneseed juniper and pinyon is NOT present. Associates – various woodland oaks and cercocarpus, ponderosa pine, Arizona cypress, and Douglas-fir. Sites -- lower elevation with low annual precipitation.

185 Pinyon-juniper woodland: Includes all pinyons and all junipers except Rocky Mountain and western juniper. Must have pinyon present. Associates – various woodland oaks and cercocarpus, ponderosa pine, Arizona cypress, and Douglas-fir. Sites--occurs at lower elevations with low annual precipitation.

DOUGLAS-FIR GROUP

201 Douglas-fir: Associates – western hemlock, grand fir, Pacific silver fir, white fir, noble fir, California red fir, western redcedar, bigleaf maple, red alder, ponderosa pine, western white pine, western hemlock, Sitka spruce. Sites -- throughout the western U.S.

202 Port-Orford-cedar: Associates – Douglas-fir, western hemlock, Sitka spruce, grand fir, lodgepole pine, western redcedar, redwood, tanoak, red alder, bigleaf maple and California laurel. Sites -- higher elevations tending to occur on northerly aspects.

203 Bigcone Douglas-fir: Associates – Canyon live oak, ponderosa, Jeffrey, sugar, knobcone, and Coulter pines, incense-cedar, white fir, California black oak, California laurel, and bigleaf maple. Sites -- Mainly confined to the Transverse and Peninsular Ranges of southern California. Stands are found on many combinations of slope, aspect, soil, but as elevations increase, the preferred aspect shifts from cooler to warmer slopes.

PONDEROSA PINE GROUP

221 Ponderosa pine (includes Arizona pine): Associates – Douglas-fir, lodgepole pine, grand fir, Jeffrey pine, western larch, quaking aspen, Utah juniper, Gambel oak. Sites -- this forest type is distributed over vast areas in the West and therefore can have great differences in environmental conditions.

222 Incense-cedar: Associates – Douglas-fir, ponderosa pine, sugar pine, western white pine, Jeffrey pine, white and grand fir, western hemlock, western redcedar, Port-Orford-cedar, giant sequoia, Oregon white oak, California black oak, tanoak, giant chinkapin, and Pacific madrone; it is rarely found in pure stands. Sites -- Grows from the coastal fog belt to the dry inland slopes of eastern California and central Oregon. Once established, incense-cedar is a good competitor on hot, dry sites and commonly shares an upper canopy position on southwestern slopes. On cooler, moister aspects, it is usually subdominant to other species.

224 Sugar pine: Associates – In the northern part of its range: Douglas-fir, ponderosa pine, grand fir, incense-cedar, western hemlock, western redcedar, Port-Orford-cedar, tanoak, and madrone. In the central part of its range: ponderosa pine, Jeffrey pine, white fir, incense-cedar, California red fir, giant sequoia, and California black oak. Farther south: Jeffrey pine, ponderosa pine, Coulter pine, incense-cedar, white fir, and bigcone Douglas-fir. Sites -- grows in areas that have warm, dry summers and

cool, wet, mild winters. Terrain is commonly steep and rugged, favoring warm exposures as the elevation increases. Found in Oregon and California, but is most abundant in the mixed conifer forests on the west slope of the Sierra Nevada.

225 Jeffrey pine: Associates – Incense-cedar, ponderosa pine, sugar pine, Douglas-fir, Port-Orford-cedar, western white pine, knobcone pine, gray pine, red and white fir. Sites -- thrives in fairly harsh environments throughout most of its range, and is cold hardy, drought tolerant, adapted to short growing seasons, and tolerant of infertile sites. The majority of trees are found in California, although its range extends into SW Oregon and western Nevada.

226 Coulter pine: Associates – blue oak, California black oak, interior live oak, coast live oak, valley oak, California scrub oak, buckeye, ponderosa pine. Sites -- grows singly or in small stands primarily on dry, rocky slopes of southern California coastal ranges, between 3,000 and 6,000 feet. Occurs from Mt. Diablo and the Santa Lucia Mountains down to the San Bernardino, San Jacinto, and Cuyamaca Mountains in the south.

WESTERN WHITE PINE GROUP

241 Western white pine: Associates – western larch, grand fir, western redcedar, and western hemlock. Sites -- occurs primarily on moist, mid-elevation sites from 1,500 to 4,000 feet.

FIR/SPRUCE/MOUNTAIN HEMLOCK GROUP

261 White fir: Associates – Douglas-fir, sugar pine, ponderosa pine, Jeffrey pine, incense-cedar, California red fir, blue spruce, limber pine, and aspen. Sites -- deep well-drained sandy loam-covered slopes and benches with a northerly exposure.

262 Red fir (includes California and Shasta red fir): Associates – Jeffrey pine, western white pine, lodgepole pine, mountain hemlock, and sugar pine. Sites -- found at elevations ranging from 5,400 to 7,500 feet.

263 Noble fir: Associates - Douglas-fir, Pacific silver fir, western and mountain hemlocks, lodgepole pine, western redcedar, and Alaska cedar. Sites -- found on a variety of sites where precipitation is high and snowpacks are common, generally above 3,000 feet in elevation in the Cascade and Coast ranges.

264 Pacific silver fir: Associates - western and mountain hemlocks, western redcedar, Alaska cedar, grand fir, Sitka spruce, lodgepole pine, subalpine fir, and Engelmann spruce. Sites -- most abundant on sites where summer drought is minimal and snowpacks are common, such as areas of heavy rainfall, seepage, or prolonged snowmelt.

265 Engelmann spruce: Associates – western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, subalpine fir, and lodgepole pine. For this type to be used, the total stocking of Engelmann spruce must be at least 75 percent of the total stocking.

266 Engelmann spruce-subalpine fir: Associates – western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, and lodgepole pine. Sites -- this type is widespread in the Western U.S. For this type to be used, the sum of the stocking of Engelmann spruce and subalpine fir must be at least 75 percent of the total stocking and Engelmann spruce stocking must be between 5 and 74 percent of total and subalpine fir stocking must be between 5 and 74 percent of total.

267 Grand fir: Associates – ponderosa pine, Douglas-fir, western hemlock, western redcedar, western white pine, Pacific yew, lodgepole pine, and western larch. Sites -- in Idaho, found on moist slopes from 1,500 to 5,200-foot elevations; in Oregon, it occupies moist low-elevation sites, but also extends up to mid-elevations to as high as 6,000 feet.

268 Subalpine fir: Associates – western white pine, western redcedar, western hemlock, Douglas-fir, western larch, grand fir, Engelmann spruce, and lodgepole pine. For this type to be used, the total stocking of subalpine fir must be at least 75 percent of the total stocking. Sites -- found at high elevations, near timberline.

269 Blue spruce: Associates – Douglas-fir, ponderosa pine, white fir, lodgepole pine, and Rocky Mountain juniper. Sites -- restricted to the southern Rocky Mountains, typically located in the montane zone.

270 Mountain hemlock: Associates – Alaska-cedar, Pacific silver fir, western white pine, lodgepole pine, noble fir, and subalpine fir. Sites -- occurs in cold, moist regions and growing conditions are poor.

271 Alaska-yellow-cedar: Associates: In California, California red fir, Brewer spruce, incense-cedar, Pacific yew, and western white pine; in Oregon and Washington, found with mountain hemlock, subalpine fir, Pacific silver fir, noble fir, western white pine, and western hemlock. Sites -- Cool and humid climate, most stands grow within 100 miles of the Pacific coast.

LODGEPOLE PINE GROUP

281 Lodgepole pine: Associates – subalpine fir, Engelmann spruce, white spruce, Douglas-fir, western redcedar, red alder, and western hemlock. Sites -- one of the most widespread types in the Western U.S. tolerating a broad range of temperature and moisture regimes.

HEMLOCK/SITKA SPRUCE GROUP

301 Western hemlock: Associates – Sitka spruce, western redcedar, Douglas-fir, Alaska-yellow-cedar, grand fir, Engelmann spruce, bigleaf maple, and red alder. Sites -- nearly any soil provides a seedbed but requires abundant moisture. Often comes in cut-over or burned-over areas.

304 Western redcedar: Associates – western white pine, western hemlock, western larch, grand fir, Douglas-fir, and Pacific silver fir. Sites -- inhabits moist flats and slopes, the banks of rivers and swamps and can be found in bogs.

305 Sitka spruce: Associates – western hemlock, Douglas-fir, western redcedar, Port Orford-cedar, red alder, bigleaf maple, and black cottonwood. Sites - -limited to a relatively narrow oceanside strip characterized by mild winters, cool summers, and abundant moisture throughout the growing season.

WESTERN LARCH GROUP

321 Western larch: Associates – Douglas-fir, subalpine fir, lodgepole pine, Engelmann spruce, western hemlock, and western redcedar. Sites -- best growth on deep, moist, porous soils in high valleys and on mountain slopes of northern and western exposure.

REDWOOD GROUP

341 Redwood: Associates – Douglas-fir, grand fir, western hemlock, California torreya, Pacific yew, and western redcedar. Sites -- largely confined to coastal topography between 35 degrees 41 minutes and 42 degrees 9 minutes north latitude.

342 Giant sequoia: Associates: California white fir, sugar pine, incense-cedar, California red fir, California white fir, ponderosa pine and California black oak. Sites -- Deep, well-drained soils with high soil moisture available during dry summers. Most stands found above 4,000 feet elevation, rarely forming pure stands.

OTHER WESTERN SOFWOODS GROUP

361 Knobcone pine: Associates – Gray pine, canyon live oak and many western oaks, Douglas-fir, and Port Orford-cedar. Sites -- found on soils that are shallow, dry, stony or high in magnesium.

362 Southwestern white pine: Associates- Douglas-fir, white fir, ponderosa pine, Gambel oak, and aspen. Sites -- higher elevations in Arizona and New Mexico

363 Bishop pine: Grows singly or in small stands along the coast of California.

364 Monterey pine: Grows singly or in small stands. Sites -- Native stands are found in the high humidity and summer fogs of the central-coast area of California in San Mateo, Santa Cruz, Monterey, and San Luis Obispo Counties.

365 Foxtail pine/bristlecone pine: Associates – limber pine, white fir, Engelmann spruce, ponderosa pine, and pinyon. Sites -- found on rocky outcrops, usually on southern or southwestern exposures and can range in elevation from 8,000 to 11,000 feet.

366 Limber pine: Associates – low to mid elevations: Douglas-fir, ponderosa pine, Rocky Mountain juniper; mid to high elevations: lodgepole pine and aspen; high elevations: Engelmann spruce, subalpine fir, bristlecone pine, and whitebark pine. Sites -- a very wide range of elevations and latitudes across the Rocky mountains; can be the majority species as an early seral stage under a variety of harsh establishment conditions, as climax in dry, high elevation sites in the central and southern Rockies.

367 Whitebark pine: Associates – subalpine fir, subalpine larch, Engelmann spruce, and lodgepole pine. Sites -- poor, high elevation.

368 Miscellaneous western softwoods: A “catch-all” group for such species as all cypress (Cupressus) species, subalpine larch, Brewer spruce, Apache pine, Chihuahua pine, Washoe pine, Torrey pine, Pacific yew, and California torreya.

369 Western juniper: Associates – ponderosa pine and Jeffrey pine. Sites -- found on dry sites and ranges in elevation from just above sea level to 6,500 feet.

CALIFORNIA MIXED CONIFER GROUP

371 California mixed conifer: Associates - a complex association of ponderosa pine, sugar pine, Douglas-fir, white fir, red fir, and incense-cedar. Generally, five or six conifer species are intermixed either as single trees or in small groups. Sites -- Mixed conifer sites are often on east-facing slopes of the California Coast Range and on the west-facing and higher elevation east-facing slopes of the Oregon Cascades and Sierra Nevadas.

EXOTIC SOFTWOODS GROUP

381 Scotch pine: plantation type, not naturally occurring.

383 Other exotic softwoods; Austrian pine

384 Norway spruce: plantation type, not naturally occurring

385 Introduced larch: introduced larch (species code 0070)

OTHER SOFTWOODS GROUP

391 Other softwoods: All softwood species identified to genus level only, except cypress, baldcypress, and larch.

OAK/PINE GROUP
In these oak/pine forest types, stocking of the pine component needs to be 25-49 percent.

401 Eastern white pine/northern red oak/white ash: Associates – red maple, basswood, yellow birch, bigtooth aspen, sugar maple, beech, paper birch, black cherry, hemlock, and sweet birch. Sites -- deep, fertile, well-drained soil.

402 Eastern redcedar/hardwood: Associates – oak, hickory, walnut, ash, locust, dogwood, blackgum, hackberry, winged elm, shortleaf pine, and Virginia pine. Sites -- usually dry uplands and abandoned fields.

403 Longleaf pine/oak: Longleaf pine and scrub oaks-primarily turkey, bluejack, blackjack, and dwarf post oak--comprise the type. Associates--southern scrub oaks in the understory. Sites -- common on sandhills where soils are dry, infertile, and coarse textured. SRS distribution-- coastal plain and piedmont units.

404 Shortleaf pine/oak: Associates - (oaks generally include white, scarlet, blackjack, black, post, and southern red) hickory, blackgum, sweetgum, Virginia pine, and pitch pine. Sites -- generally in dry, low ridges, flats, and south slopes.

405 Virginia pine/southern red oak: Associates – black oak, scarlet oak, white oak, post oak, blackjack oak, shortleaf pine, blackgum, hickory, pitch pine, table-mountain pine, chestnut oak. Sites -- dry slopes and ridges.

406 Loblolly pine/hardwood: Associates – wide variety of moist and wet site hardwoods including blackgum, sweetgum, yellow-poplar, red maple, white and green ash, and American elm; on drier sites associates include southern and northern red oak, white oak, post oak, scarlet oak, persimmon, and hickory. Sites -- usually moist to very moist though not wet all year, but also on drier sites.

407 Slash pine/hardwood: Slash pine and a variable mixture of hardwoods comprise the type. Associates-- codominant with the slash pine component are sweetbay, blackgum, loblolly-bay, pondcypress, pond pine, Atlantic white-cedar, red maple, ash, and water oak. Sites -- undrained or poorly drained depressions such as bays or pocosins and along pond margins. SRS distribution--primarily coastal plain units.

409 Other pine/hardwood: A type used for those unnamed pine-hardwood combinations that meet the requirements for oak-pine. These are stands where hardwoods (usually oaks) comprise the plurality of the stocking with at least a 25 to 49 percent pine, eastern redcedar, or southern redcedar component.

OAK/HICKORY GROUP

501 Post oak/blackjack oak (includes dwarf post oak): Associates – black oak, hickory, southern red oak, white oak, scarlet oak, shingle oak, live oak, shortleaf pine, Virginia pine, blackgum, sourwood, red maple, winged elm, hackberry, chinkapin oak, shumard oak, dogwood, and eastern redcedar. Sites -- dry uplands and ridges.

502 Chestnut oak: Associates – scarlet oak, white oak, black oak, post oak, pitch pine, blackgum, sweetgum, red maple, red oak, shortleaf pine, Virginia pine. Sites -- rocky outcrops with thin soil, ridge tops.

503 White oak/red oak/hickory (includes all hickories except water and shellbark hickory): Associates – pin oak, northern pin oak, chinkapin oak, black oak, dwarf chinkapin oak, American elm, scarlet oak, bur oak, white ash, sugar maple, red maple, walnut, basswood, locust, beech, sweetgum, blackgum, yellow-poplar, and dogwood. Sites -- wide variety of well-drained upland soils.

504 White oak: Associates – black oak, northern red oak, bur oak, hickory, white ash, yellow-poplar. Sites -- scattered patches on upland, loamy soils but on drier sites than type 503.

505 Northern red oak: Associates – black oak, scarlet oak, chestnut oak, and yellow-poplar. Sites -- spotty distribution on ridge crests and north slopes in mountains but also found on rolling land, slopes, and benches on loamy soil.

506 Yellow-poplar/white oak/northern red oak: Associates – black oak, hemlock, blackgum, and hickory. Sites -- northern slopes, coves, and moist flats.

507 Sassafras/persimmon: Associates – elm, eastern redcedar, hickory, ash, sugar maple, yellow-poplar, Texas sophora, and oaks. Sites -- abandoned farmlands and old fields.

508 Sweetgum/yellow-poplar: Associates – red maple, white ash, green ash, and other moist site hardwoods. Sites -- generally occupies moist, lower slopes.

509 Bur oak: Associates—northern pin oak, black oak, chinkapin oak, and eastern redcedar in northern and dry upland sites; shagbark hickory, black walnut, eastern cottonwood, white ash, American elm, swamp white oak, honey locust, and American basswood in southern and lowland sites. Sites -- drier uplands to moist bottomlands with the drier uplands more common in the northern part of the range and the moist bottomlands more common in the southern part of the range.

510 Scarlet oak: Associates – black oak, southern red oak, chestnut oak, white oak, post oak, hickory, pitch pine, blackgum, sweetgum, black locust, sourwood, dogwood, shortleaf pine, and Virginia pine. Sites -- dry ridges, south- or west-facing slopes and flats but often moister situations probably as a result of logging or fire.

511 Yellow-poplar: Associates – black locust, red maple, sweet birch, cucumbertree, and other moist-site hardwoods (except sweetgum, see type 508) and white oak and northern red oak (see type 503). Sites -- lower slopes, northerly slopes, moist coves, flats, and old fields.

512: Black walnut: Associates – yellow-poplar, white ash, black cherry, basswood, beech, sugar maple, oaks, and hickory. Sites -- coves and well-drained bottoms.

513 Black locust: Associates – many species of hardwoods and hard pines may occur with it in mixture, either having been planted or from natural seeding. Sites -- may occur on any well-drained soil but best on dry sites, often in old fields.

514 Southern scrub oak: This forest cover type consists of a mixture of scrub oaks that may include several of the following species: turkey oak, bluejack oak, dwarf live oak, Durand oak, and bear oak (otherwise known as scrub oak). Also includes anacahuita. Sites -- dry sandy ridges-the type frequently develops on areas formerly occupied by longleaf pine. SRS distribution--common throughout all coastal plain units and into the lower Piedmont.

515 Chestnut oak/black oak/scarlet oak: Associates—northern and southern red oaks, post oak, white oak, sourwood, shagbark hickory, pignut hickory, yellow-poplar, blackgum, sweetgum, red maple, eastern white pine, pitch pine, Table Mountain pine, shortleaf pine, and Virginia pine. Sites -- dry upland sites on thin-soiled rocky outcrops on dry ridges and slopes.

516 Cherry/white ash/yellow-poplar: Associates – sugar maple, American beech, northern red oak, white oak, blackgum, hickory, cucumbertree, and yellow birch. Sites -- fertile, moist, well-drained sites.

517 Elm/ash/black locust: Associates – Black locust, silver maple, boxelder, blackbead ebony, American elm, slippery elm, rock elm, red maple, green ash predominate. Found in North Central region, unknown in Northeast. Sites -- upland.

519 Red maple/oak: Associates – the type is dominated by red maple and some of the wide variety of central hardwood associates include upland oak, hickory, yellow-poplar, black locust, sassafras as well as some central softwoods like Virginia and shortleaf pines. Sites -- uplands.

520 Mixed upland hardwoods: Includes Ohio buckeye, yellow buckeye, Texas buckeye, red buckeye, painted buckeye, American hornbeam, American chestnut, eastern redbud, flowering dogwood, hawthorn spp., cockspur hawthorn, downy hawthorn, Washington hawthorn, fleshy hawthorn, dwarf hawthorn, honeylocust, Kentucky coffeetree, Osage-orange, all mulberries, blackgum, sourwood, southern red oak, shingle oak, laurel oak, water oak, live oak, willow oak, black locust, blackbead ebony, anacahuita, and September elm. Associates – Any mixture of hardwoods of species typical of the upland central hardwood region, should include at least some oak. Sites--wide variety of upland sites.

OAK/GUM/CYPRESS GROUP

601 Swamp chestnut oak/cherrybark oak: Associates – Shumard oak, Delta post oak, white ash, hickory, white oak, blackgum, sweetgum, southern red oak, post oak, American elm, winged elm, yellow-poplar, and beech. Sites -- within alluvial flood plains of major rivers, on all ridges in the terraces, and on the best fine sandy loam soils on the highest first bottom ridges.

602 Sweetgum/Nuttall oak/willow oak: Associates – American holly, green ash, American elm, pecan, cottonwood, red maple, honeylocust, persimmon, anacahuita. Sites -- very wet.

605 Overcup oak/water hickory (includes shellbark hickory): Associates – pin oak, willow oak, American elm, green ash, hackberry, persimmon, and red maple. Sites -- in South within alluvial flood plains in low, poorly drained flats with clay soils; also in sloughs and lowest backwater basins and low ridges with heavy soils that are subject to late spring inundation.

606 Atlantic white-cedar: Associates – North includes gray birch, pitch pine, hemlock, blackgum, and red maple. South includes pond pine, baldcypress, and red maple. Sites -- usually confined to sandy-bottomed, peaty, interior, and river swamps, wet depressions, and stream banks.

607 Baldcypress/water tupelo: 25-50 percent stocking of baldcypress (either baldcypress or Montezuma baldcypress). Associates – blackgum, willow, red maple, American elm, persimmon, overcup oak, and sweetgum. Sites -- very low, poorly drained flats, deep sloughs, and swamps; wet most all the year. Also, floodplains and stream margins.

608 Sweetbay/swamp tupelo/red maple: Associates – blackgum, Florida maple, water birch, gum bumelia, waterlocust, loblolly bay, all magnolias, red maple, Ogechee tupelo, red bay, water-elm, Oglethorpe oak, loblolly and pond pines, American elm, and other moist-site hardwoods. Sites -- very moist but seldom wet all year--shallow ponds, muck swamps, along smaller creeks in Coastal Plain (rare in Northeast).

609 Baldcypress/pondcypress: > 50 percent stocking of baldcypress and/or pondcypress. Associates – blackgum, willow, red maple, American elm, persimmon, overcup oak, and sweetgum. Sites -- very low, poorly drained flats, deep sloughs, and swamps; wet most all the year. Also, floodplains and stream margins.

ELM/ASH/COTTONWOOD GROUP

701 Black ash/American elm/red maple (includes slippery and rock elm): Associates – swamp white oak, silver maple, sycamore, pin oak, blackgum, white ash, and cottonwood. Sites -- moist to wet areas, swamps, gullies, and poorly drained flats.

702 River birch/sycamore: Associates – red maple, black willow, and other moist-site hardwoods. Sites -- moist soils at edges of creeks and rivers.

703 Cottonwood: Associates – willow, white ash, green ash, and sycamore. Sites -- streambanks where bare, moist soil is available.

704 Willow (includes peachleaf and black willow): Associates – cottonwood, green ash, sycamore, pecan, American elm, red maple, and boxelder. Sites -- streambanks where bare, moist soil is available.

705 Sycamore/pecan/American elm (includes slippery and rock elm): Associates – sweetgum, green ash, hackberry, silver maple, cottonwood, willow, boxelder, and river birch. Sites -- bottomlands, alluvial flood plains of major rivers.

706 Sugarberry/hackberry/elm/green ash (includes American, winged, cedar, slippery and rock elm): Associates – boxelder, pecan, blackgum, persimmon, honeylocust, red maple, hackberry, and boxelder. Sites -- low ridges and flats in flood plains.

707 Silver maple/American elm: Silver maple and American elm are the majority species in this type. Associates – chalk maple, sweetgum, pin oak, swamp white oak, eastern cottonwood, sycamore, green ash, and other moist-site hardwoods, according to the region. Sites -- primarily on well-drained moist sites along river bottoms and floodplains, and beside lakes and larger streams.

708 Red maple/lowland: Red maple comprises a majority of the stocking. Because this type grows on a wide variety of sites over an extensive range, associates are diverse. Associates include yellow-poplar, blackgum, sweetgum, and loblolly pine. Site -- generally restricted to very moist to wet sites with poorly drained soils, and on swamp borders.

709 Cottonwood/willow (includes peachleaf, black and Bebb willow): Associates – white ash, green ash, sycamore, American elm, red maple and boxelder. Sites -- stream banks where bare, moist soil is available.

722 Oregon ash: Associates - red alder, bigleaf maple, black cottonwood, willow. Sites -- riparian areas, prefers damp, loose soils, below 3000 feet.

MAPLE/BEECH/BIRCH GROUP

801 Sugar maple/beech/yellow birch: Associates – butternut, basswood, red maple, hemlock, northern red oak, white ash, white pine, black cherry, sweet birch, American elm, rock elm, and eastern hophornbeam. Sites -- fertile, moist, well-drained sites.

802 Black cherry: Associates – sugar maple, northern red oak, red maple, white ash, basswood, sweet birch, butternut, American elm, and hemlock. Sites -- fertile, moist, well-drained sites.

805 Hard maple/basswood (includes American, Carolina, and white basswood): Associates – black maple, white ash, northern red oak, eastern hophornbeam, American elm, red maple, eastern white pine, eastern hemlock. Sugar maple and basswood occur in different proportions but together comprise the majority of the stocking. Sites -- fertile, moist, well-drained sites.

809 Red maple/upland: Associates – the type is dominated by red maple and some of the wide variety of northern hardwood associates include sugar maple, beech, birch, aspen, as well as some northern softwoods like white pine, red pine, and hemlock; this type is often the result of repeated disturbance or cutting. Sites -- uplands. (See Type 519 under oak/hickory group)

ASPEN/BIRCH GROUP

901 Aspen: Associates – Engelmann spruce, lodgepole pine, ponderosa pine, Douglas-fir, subalpine fir, white fir, white spruce, balsam poplar, and paper birch. Sites -- aspen has the capacity to grow on a variety of sites and soils, ranging from shallow stony soils and loamy sands to heavy clays.

902 Paper birch (includes northern paper birch): Associates – aspen, white spruce, black spruce, and lodgepole pine. Sites -- can be found on a range of soils, but best developed on well-drained sandy loam and silt loam soils.

903 Gray birch: Associates – oaks, red maple, white pine, and others. Sites -- poor soils of abandoned farms and burns.

904 Balsam poplar: Associates – paper birch, white spruce, black spruce, and tamarack. Sites -- occurs on rich floodplains where erosion and folding are active.

905 Pin cherry: Associates – quaking and bigtooth aspen; paper and yellow birch; striped, red and sugar maple; beech; northern red oak; balsam fir; and red spruce. In the Appalachians, Fraser fir and mountain-ash are additional associates. In the central and Lake States, chokecherry and black cherry are common. Sites -- Occurs over a wide range of soils and drainage classes, found on sites varying from dry rocky ledges and sandy plains to moist loamy soils.

ALDER/MAPLE GROUP

911 Red alder: Associates - Douglas-fir, western hemlock, western redcedar, grand fir, Sitka spruce, black cottonwood, bigleaf maple, willow. Sites -- stream bottoms and lower slopes, west of the Cascades, usually within 125 miles of the coast, below 2,400 feet.

912 Bigleaf maple: Associates - Douglas-fir, western hemlock, western redcedar, black cottonwood, Pacific madrone, Pacific dogwood, red alder. Sites -- Flat interior valleys, gently sloping stream bottoms, and moderate to steep slopes; favors moist, well-drained soils of river terraces and flood plains, but also grows on drier rocky, south-facing slopes in the Coast Ranges of northwestern Oregon.

WESTERN OAK GROUP

921 Gray pine: Associates - Blue oak, California black oak, interior live oak, coast live oak, valley oak, California scrub oak, buckeye, western juniper, Coulter pine. Sites -- dry foothill woodland communities of California's Central Valley, on rocky slopes and steep canyon walls below 3,000 feet. Prefers areas with hot, dry summers and absence of summer fog. Tolerates infertile, low moisture soils.

922 California black oak: Associates – ponderosa pine, Douglas-fir, incense-cedar, knobcone pine, Pacific madrone, tanoak, and Oregon white oak.

923 Oregon white oak: Associates – Douglas-fir, bigleaf maple, and Oregon ash. Sites -- commonly occurs in very moist locations, in mixture with Oregon ash on floodplains of the Willamette Valley, and on poorly drained heavy clay soils.

924 Blue oak: Associates – Gray pine, interior live oak, canyon live oak, valley oak, and California buckeye. Sites -- low valleys and foothills of the Coast Ranges and Sierras in California.

931 Coast live oak: Associates – knobcone pine, Monterey pine, interior live oak, valley oak, blue oak, tanoak, Pacific madrone, and California laurel. Sites -- usually occupies well-drained soils.

933 Canyon live oak: Associates – Douglas-fir, bigcone Douglas-fir, ponderosa pine, Jeffrey pine, bigleaf maple, Pacific madrone, and California laurel. Sites -- found on steep rocky canyon slopes and boulder-filled bottoms.

934 Interior live oak: Associates - Blue oak, coast live oak, valley oak, canyon live oak, gray pine, ponderosa pine, Douglas-fir. Sites -- from valleys to foothills, below 5,000 feet; grows on moister sites than blue oak.

935 California white oak (valley oak): Associates - Canyon live oak, coast live oak, California black oak, blue oak, California buckeye, gray pine, ponderosa pine. Sites -- hot interior valleys and slopes below 2,000 feet; tolerates cool wet winters and hot dry summers; prefers fertile soils of valley floors.

TANOAK/LAUREL GROUP

941 Tanoak: Associates – Douglas-fir, Pacific madrone, and canyon live oak. Sites -- sea level to 5,000 feet elevation from southern Oregon south along the Coast Ranges to the Santa Ynez Mountains in California.

942 California laurel: Associates - usually found in mixed stands with a wide variety of associated species. Sites -- from the cool, humid conditions of dense coastal forests to hot, dry sites found inland in open woodlands and chaparral, below 4,000 feet.

943 Giant chinkapin: Associates - rarely grows in pure stands, usually a component of other types. Found with Douglas-fir, western hemlock, incense-cedar, white fir, western white pine, sugar pine, ponderosa pine, Pacific madrone, tanoak, and California black oak. Sites -- from valley bottoms to ridgetops, in the coast and cascade ranges, below 5,000 feet. Tolerates infertile and droughty sites.

OTHER HARDWOODS GROUP

961 Pacific madrone: Associates - a wide variety of species, but most common with Douglas-fir and tanoak. Sites -- grows on all aspects but is found most often on those facing south and west, and tolerates low soil moisture in summer.

962 Other hardwoods: A “catch-all” group for hardwood species identified only to the genus level, with the exception of the following species (Note: This code primarily applies to a mapped subplot, where only one or two “uncommon” tree species are tallied): hackberry spp., hawthorn spp., eucalyptus spp., persimmon spp., magnolia spp., mulberry spp., mesquite spp., citrus spp., royal palm spp., willow spp., and saltcedar spp., AND striped maple, mountain maple, California buckeye, Arizona alder, serviceberry, Arizona madrone, pawpaw, sweet birch, Virginia roundleaf birch, Allegany chinkapin, Ozark chinkapin, southern catalpa, northern catalpa, yellowwood, Pacific dogwood, pumpkin ash, blue ash, velvet ash, Carolina ash, Texas ash, all silverbells, California black walnut, southern California black walnut, Texas walnut, Arizona walnut, all apple species, eastern hophornbeam, California sycamore, Arizona sycamore, chokecherry, peach, Canada plum, wild plum, bitter cherry, Allegheny plum, Chickasaw plum, sweet cherry, sour cherry, European plum, Mahaleb plum, western soapberry, American mountain-ash, northern mountain-ash, Joshua tree, smoketree, great leucaena, and berlandier ash.

WOODLAND HARDWOODS GROUP

971 Deciduous oak woodland: areas with predominantly Gambel oak, which is often associated with ponderosa pine, white fir, Douglas-fir, alligator juniper, bigtooth maple, and chokecherry. Sites -- most soils, on elevations generally ranging from 4,000 to 8,000 feet.

972 Evergreen oak woodland: areas with predominantly evergreen oaks, such as Arizona white oak, Emory oak, Engelmann oak, Mexican blue oak, silverleaf oak, gray oak and/or netleaf oak. Other associates – various pinyons and junipers. Sites -- alluvial soils, from 4,000 to 7,500 feet elevation.

973 Mesquite woodland: Honey mesquite and screwbean mesquite comprise the majority of the stocking of this cover type. Honey mesquite associates, which are many, vary with climate and soils. Sites -- occurs on a wide variety of soils at elevations mostly below 5,000 feet.

974 Cercocarpus (Mountain brush) woodland (includes curlleaf mountain-mahogany): Associates - Rocky Mountain juniper, big sagebrush, and snowberry. Sites -- dry, course-textured soils.

975 Intermountain maple woodland (includes Rocky Mountain and/or bigtooth maple): Associates - chokecherry, boxelder, birchleaf mountain-mahogany, and Gambel oak. Sites -- most soils but does not tolerate long flooding periods. Found growing between 4,500 and 7,500 feet elevation.

976 Miscellaneous woodland hardwoods [includes acacia, New Mexico locust, and/or Arizona ironwood (tesota)]. Sites – occurs on a wide variety of soils at elevations mostly below 5,000 feet.

TROPICAL HARDWOODS GROUP

982 Mangrove: Forests in which mangrove comprises a majority of the stocking. Associates--cabbage palm on some of the higher sites in the area. Sites -- predominantly salt marshes; mangrove frequently develops its own island or shoreline made up of a dense mat of root structures. SRS distribution--restricted to South Florida and the Keys.

983 Palms: Includes paurotia-palm, silver palm, coconut palm, royal palm spp., cabbage palmetto, Mexican palmetto, key thatch palm, Florida thatch palm, and other palms. Associates – Sand live oak, slash pine, live oak, laurel oak, water oak, baldcypress, southern magnolia, red maple, redbay, swamp tupelo, sweetgum, southern redcedar, and loblolly pine. In extreme southern Florida, tropical hardwoods replace temperate hardwoods as associates. Sites -- can tolerate a broad range of soil pH, salinity, and drainage.

984 Dry forest (FGDC – Lowland to Submontane Drought Deciduous, Semi-deciduous and Semi-evergreen Forest; Holdridge life zone - Subtropical Dry Forest): *Bursera simaruba* (L.) Sarg., *Bucida buceras* L., *Cephalocereus royenii* (L.) Britton, and *Guaiacum officinale* L. are species commonly associated with Puerto Rican dry forest. The more heavily-disturbed dry forest areas have numerous, smaller stemmed *Leucaena leucocephala* (Lam.) deWit, *Prosopis juliflora* (Sw.) DC., *Acacia macracantha* Humb. & Bonpl. and *Acacia farnesiana* (L.) Willd. individuals. Some of the native tree species that are common in subtropical dry forest in the U.S. Virgin Islands are *Bursera simaruba* (L.) Sarg., *Amyris elemifera* L., *Capparis cynophallophora* L., *Cordia ricksecker*i Millsp., *Pisonia subcordata* Sw., *Guaiacum officinale* L., *Plumeria alba* L., and *Pictetia aculeata* (Vahl) Urban. The more heavily-disturbed dry forest areas have numerous, smaller stemmed *Leucaena leucocephala* (Lam.) deWit, *Prosopis juliflora* (Sw.) DC., *Acacia macracantha* Humb. & Bonpl., and *Acacia farnesiana* (L.) Willd. Individuals.

985 Moist forest (FGDC – Lowland and Submontane Seasonal Evergreen; Holdridge life zone – Subtropical Moist Forest): In the Caribbean, subtropical moist forests are found in areas with 1000 to 2200 mm of annual precipitation. The subtropical moist life zone is the most extensive on Puerto Rico and covers a wide variety of soil parent materials, topographic classes and land uses resulting in highly diverse mixes that typically include *Tabebuia heterophylla* (DC.) Britton, *Spathodea*

campanulata Beauv., *Guarea guidonia* (L.) Sleumer, *Andira inermis* (W. Wright) Kunth ex DC., *Roystonea borinquena* O. F. Cook, *Mangifera indica* L., *Cecropia peltata* L., *Schefflera morototonii* (Aubl.) Maguire, Steyermark and species of the *Nectandra*, *Ocotea*, and *Coccoloba* genera. Some of the many natural indicator species of subtropical moist forest in the U.S. Virgin Islands include the *Andira inermis* (W. Wright) Kunth ex DC., *Guapira fragrans* (Dum.-Cours.) Little, *Spondias mombin* L., *Bucida buceras* L., *Hura crepitans* L., *Ceiba pentandra* (L.) Gaertn., *Cedrela odorata* L., *Pimenta racemosa var. racemosa*, *Roystonea borinquena* O.F. Cook (on St. Croix only), *Hymanaea courbaril* L., *Cecropia schreberiana* Miq., and *Tabebuia heterophylla* (DC.) Britt. While subtropical moist forests have some of the same introduced species found in subtropical dry forest, *Tamarindus indica* L. and *Melicoccus bijugatus* Jacq. are also common.

986 Wet and rain forest (FGDC – Submontane Evergreen Forest; Holdridge life zone – Subtropical Wet and Rain Forest): In the Caribbean, subtropical wet and rain forests are found in areas with 2000 to 4000 mm of annual precipitation. *Dacryodes excelsa* Vahl., *Sloanea berteriana* Choisy, *Manilkara bidentata* (A.DC.) are species indicative of the tabonuco forest type. *Cecropia peltata* L., *Schefflera morototonii* (Aubl.) Maguire and *Ochroma lagopus* Sw. are also common in wet forest stands at early stages of succession or recovery from disturbance. Wet forest shade coffee plantations hold species such as *Guarea guidonia* (L.) Sleumer, *Inga laurina* (Sw.) Willd., *Inga vera* Willd., and *Erythrina poeppigiana* (Walp.) O.F. Cook.

987 Lower montane wet and rain forest (FGDC – Montane Evergreen Forest; Holdridge life zone – Lower Montane Wet and Rain Forest): In the Caribbean, lower montane wet and rain forests are found in areas with elevations between 700-1000 meters. Forest types and their typical species include the palo colorado forest type (*Cyrilla racemiflora* L., *Ocotea spathulata* Mez., *Micropholis guyanensis (A. DC.) Pierre* and *Micropholis garciniifolia* Pierre), elfin forest type (*Eugenia borinquensis* Britton, *Tabebuia rigida* Urban, *Weinmannia pinnata* L. and *Calycogonium squamulosum* Cogn.) and the palm brake forest type (*Prestoea montana* (Graham) Nichols.).

988 Cloud forest - These forests are covered with clouds or fog much of the time. The trees have low canopies and are often dripping with moisture. The trees are typically small-leafed and covered with masses of epiphytic mosses and liverworts, which also form a deep ground cover.

989 Other tropical hardwoods: This type consists of dense forests of hardwood trees and palms. Includes gumbo-limbo, tamarind, poisonwood, pigeon-plum, torchwood, willow bustic, false mastic, pond apple, sheoak, gray sheoak, river sheoak, camphor tree, fiddlewood, citrus spp., soldierwood, Geiger tree, carrotwood, red stopper, inkwood, strangler fig, shortleaf fig, blolly, manchineel, paradise tree, Java plum, false tamarind, mango, fishpoison tree, and octopus tree. Associates –black ironwood (leadwood), lancewood, and mastic as well as more temperate live oak and red bay. Sites -- Occurs on land slightly higher than surrounding fresh and saltwater marshes or on pine land.

EXOTIC HARDWOODS GROUP

991 Paulownia: Stands with the majority of stocking comprised of *Paulownia tomentosa*, commonly known as Princess tree, royal paulownia or empress tree. Sites -- can be found along roadsides, streambanks, and forest edges. It tolerates infertile and acid soils and drought conditions. It easily adapts to disturbed habitats, including previously burned areas, forests defoliated by pests (such as the gypsy moth) and landslides and can colonize rocky cliffs and scoured riparian zones. Paulownia can also be found in plantations.

992 Melaleuca: Stands with the majority of stocking comprised of melaleuca (*Melaleuca quinquenervia*). Melaleuca trees, also known as punk trees or paperbark tea trees, are native to Australia. Sites -- In the gulf-coastal plain, it is found in swamps and glades, often eliminating all other forms of vegetation.

993 Eucalyptus: Associates - As an introduced and naturalized species, it has few common associates. Usually planted as an ornamental, in plantations for firewood, or along roads and parks for cover. Sites -- good drainage, low salinity, mild temperate climates.

995 Other exotic hardwoods: Includes any of the following species: Norway maple, ailanthus, mimosa, European alder, Chinese chestnut, ginkgo, Lombardy poplar, European mountain-ash, West Indian mahogany, Siberian elm, saltcedar spp., chinaberry, Chinese tallowtree, tung-oil-tree, Russian-olive, and avocado.

For nonstocked stands, see sections 2.5.3 for procedures to determine FOREST TYPE.

Appendix 3. FIA Tree Species Codes

This list includes all tree species tallied by FIA. Conifer species are listed first (sorted by genus), followed by hardwoods (sorted by genus). The Exclusion columns indicate where the species are excluded even though the species is tallied in all other regions. The Past Tally columns indicate how the species were tallied in the region in previous years (AK = Alaska, C = Caribbean, P = Pacific, PNWS = Pacific Northwest South excluding Alaska, R = regional mainland on the region's tally list in field guide version 8.0, and U = urban on the tally list in field guide version 8.0). Species designated Caribbean (c), Pacific (P), and Urban (U) are commonly found in those areas, although species designated for one area may occasionally be found in another. Woodland species designate species where DRC is measured instead of DBH. Species designated as being Historic P2 species (P2) were collected as part of the P2 annual inventory, excluding the Caribbean and Pacific Islands, prior to Field Guide version 9.0.

Note that appendix 3 in any field guide version is a snapshot in time of the species code list for a specific data collection period. The date at the top of the page is the beginning date of the collection period. The Master Species List is a living document and the most up-to-date version can be accessed online (https://www.fia.fs.fed.us/library/field-guides-methods-proc/index.php) via the national FIA public web site (https://www.fia.fs.fed.us/).

Non-Urban Exclu-sion	NFS Region Exclu-sion	Main-land Exclu-sion	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
Softwoods																
.	.	.	.	11	Pacific silver fir	Abies	amabilis	ABAM	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	12	balsam fir	Abies	balsamea	ABBA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	14	Santa Lucia or bristlecone fir	Abies	bracteata	ABBR	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	15	white fir	Abies	concolor	ABCO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	16	Fraser fir	Abies	fraseri	ABFR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	17	grand fir	Abies	grandis	ABGR	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	18	corkbark fir	Abies	lasiocarpa var. arizonica	ABLAA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	19	subalpine fir	Abies	lasiocarpa	ABLA	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
.	.	.	.	20	California red fir	Abies	magnifica	ABMA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	22	noble fir	Abies	procera	ABPR	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	21	Shasta red fir	Abies	shastensis	ABSH	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	6155	New Caledonia pine	Araucaria	columnaris	ARCO32	U	P, U	U	U	.	P	U	.
.	.	.	.	6331	Callitris columellaris	Callitris	columellaris	CACO2	U	U	U	C, U	C	.	.	.
.	.	.	.	81	incense-cedar	Calocedrus	decurrens	CADE27	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	6437	gagu, australian pine	Casuarina	litorea	CALI8	U	P, U	U	U	.	P	.	.
.	.	.	.	5420	Atlas cedar	Cedrus	atlantica	CEAT4	U	U	U	U	.	.	U	.
.	.	.	.	5423	Deodar cedar	Cedrus	deodara	CEDE2	U	U	U	U	.	.	U	.
.	.	.	.	5421	cedar of Lebanon	Cedrus	libani	CELI6	U	U	U	U	.	.	U	.
.	.	.	.	41	Port-Orford-cedar	Chamaecyparis	lawsoniana	CHLA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	42	Alaska yellow-cedar	Chamaecyparis	nootkatensis	CHNO	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	5443	hinoki false cypress	Chamaecyparis	obtusa	CHOB8	U	U	U	U	.	.	U	.
.	.	.	.	5444	sawara-cypress	Chamaecyparis	pisifera	CHPI12	.	.	.	.	.	.	.	.
.	.	.	.	43	Atlantic white-cedar	Chamaecyparis	thyoides	CHTH2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6786	Japanese cedar	Cryptomeria	japonica	CRJA3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6788	Chinese fir	Cunninghamia	lanceolata	CULA	U	U	U	C, U	C	.	.	.
.	.	.	.	5800	Leyland cypress	Cupressocyparis	leylandii	CULE2	U	U	U	U	.	.	U	.
.	.	.	.	51	Arizona cypress	Cupressus	arizonica	CUAR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	52	Baker or Modoc cypress	Cupressus	bakeri	CUBA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	53	Tecate cypress	Cupressus	forbesii	CUFO2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	6795	cedar-of-Goa	Cupressus	lusitanica	CULU2	U	P, U	U	C, U	C	P	.	.

[4] Entries in this column also contain the variety name when the variety clarifies the species, or subspecies name when the subspecies clarifies the species.

Non-Urban Exclu-sion	NFS Region Exclu-sion	Main-land Exclu-sion	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
.	.	.	.	56	MacNab's cypress	Cupressus	macnabiana	CUMA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	54	Monterey cypress	Cupressus	macrocarpa	CUMA2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	55	Sargent's cypress	Cupressus	sargentii	CUSA3	R, U	PNWS, U	U	U	.	.	.	P2
.	.	.	.	6796	Italian cypress	Cupressus	sempervirens	CUSE2	U	P, U	U	C, U	C	P	.	.
.	.	.	w	61	Ashe juniper	Juniperus	ashei	JUAS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	62	California juniper	Juniperus	californica	JUCA7	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	7489	Chinese juniper	Juniperus	chinensis	JUCH4	.	U	U	U	.	.	U	.
.	.	.	w	59	redberry juniper	Juniperus	coahuilensis	JUCO11	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	63	alligator juniper	Juniperus	deppeana	JUDE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	60	Drooping juniper	Juniperus	flaccida	JUFL	R, U	U	U	R, U	.	.	.	P2
.	.	.	w	69	oneseed juniper	Juniperus	monosperma	JUMO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	64	western juniper	Juniperus	occidentalis	JUOC	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	w	65	Utah juniper	Juniperus	osteosperma	JUOS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	58	Pinchot juniper	Juniperus	pinchotii	JUPI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	66	Rocky Mountain juniper	Juniperus	scopulorum	JUSC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	67	southern redcedar	Juniperus	virginiana var. silicicola	JUVIS	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	68	eastern redcedar	Juniperus	virginiana	JUVI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6212	European larch	Larix	decidua	LADE2	U	U	U	U	.	.	U	P2
.	.	.	.	74	Japanese larch	Larix	kaempferi	LAKA2	.	.	.	.	.	.	.	.
.	.	.	.	71	tamarack (native)	Larix	laricina	LALA	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	72	subalpine larch	Larix	lyallii	LALY	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	73	western larch	Larix	occidentalis	LAOC	R, U	PNWS, U	R, U	U	.	.	.	P2
	.	.	.	75	Siberian larch	Larix	sibirica	LASI3	.	.	.	.	.	.	.	.
.	.	.	.	70	larch spp.	Larix	spp.	LARIX	R, U	U	U	U	.	.	.	P2
.	.	.	.	7779	dawn redwood	Metasequoia	glyptostroboides	MEGL8	U	U	U	U	.	.	U	.
.	.	.	.	91	Norway spruce	Picea	abies	PIAB	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	92	Brewer spruce	Picea	breweriana	PIBR	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	93	Engelmann spruce	Picea	engelmannii	PIEN	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	94	white spruce	Picea	glauca	PIGL	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
.	.	.	.	6533	Sakhalin spruce	Picea	glehnii	PIGL7	U	U	U	U	.	.	U	.
.	.	.	.	95	black spruce	Picea	mariana	PIMA	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
.	.	.	.	6538	Serbian spruce	Picea	omorika	PIOM2	U	U	U	U	.	.	U	.
.	.	.	.	96	blue spruce	Picea	pungens	PIPU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	97	red spruce	Picea	rubens	PIRU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	98	Sitka spruce	Picea	sitchensis	PISI	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	101	whitebark pine	Pinus	albicaulis	PIAL	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	102	Rocky Mountain bristlecone pine	Pinus	aristata	PIAR	R, U	PNWS, U	R, U	U	.	.	.	P2

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.	.	.	.	135	Arizona pine	Pinus	arizonica	PIAR5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	103	knobcone pine	Pinus	attenuata	PIAT	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	104	foxtail pine	Pinus	balfouriana	PIBA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	105	jack pine	Pinus	banksiana	PIBA2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8200	Bunge's pine	Pinus	bungeana	PIBU2	U	U	U	U	.	.	U	.
.	.	.	.	8201	Canary Island pine	Pinus	canariensis	PICA15	U	U	U	U	.	.	U	.
.	.	.	.	8183	Caribbean pine	Pinus	caribaea	PICA18	U	P, U	U	C, U	C	P	.	.
.	.	.	w	140	Mexican pinyon pine	Pinus	cembroides	PICE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	107	sand pine	Pinus	clausa	PICL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	108	lodgepole pine	Pinus	contorta	PICO	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	109	Coulter pine	Pinus	coulteri	PICO3	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8189	Japanese red pine	Pinus	densiflora	PIDE5	U	U	U	U	.	.	U	.
.	.	.	w	134	border pinyon	Pinus	discolor	PIDI3	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	110	shortleaf pine	Pinus	echinata	PIEC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	106	common or two-needle pinyon	Pinus	edulis	PIED	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	111	slash pine	Pinus	elliottii	PIEL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	144	Honduras pine	Pinus	elliottii var. elliottii	PIELE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	112	Apache pine	Pinus	engelmannii	PIEN2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	113	limber pine	Pinus	flexilis	PIFL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	115	spruce pine	Pinus	glabra	PIGL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8202	aleppo pine	Pinus	halepensis	PIHA7	U	U	U	U	.	.	U	.
.	.	.	.	116	Jeffrey pine	Pinus	jeffreyi	PIJE	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	117	sugar pine	Pinus	lambertiana	PILA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	118	Chihuahuan pine	Pinus	leiophylla	PILE	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	142	Great Basin bristlecone pine	Pinus	longaeva	PILO	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8184	Chinese red pine	Pinus	massoniana	PIMA11	U	U	U	C, U	C	.	.	.
.	.	.	.	8185	Merkus pine	Pinus	merkusii	PIME2	U	U	U	C, U	C	.	.	.
.	.	.	w	133	singleleaf pinyon	Pinus	monophylla	PIMO	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	w	143	Arizona pinyon pine	Pinus	monophylla var. fallax	PIMOF	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	119	western white pine	Pinus	monticola	PIMO3	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	120	bishop pine	Pinus	muricata	PIMU	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	136	Austrian pine	Pinus	nigra	PINI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8186	ocote chino	Pinus	oocarpa	PIOO2	U	U	U	C, U	C	.	.	.
.	.	.	.	121	longleaf pine	Pinus	palustris	PIPA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8197	five-needle pine	Pinus	parviflora	PIPA12	U	U	U	U	.	.	U	.
.	.	.	.	8187	Mexican weeping pine	Pinus	patula	PIPA13	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8188	maritime pine	Pinus	pinaster	PIPI6	U	P, U	U	U	.	P	.	.
.	.	.	.	8203	Italian stone pine	Pinus	pines	PIPI7	U	U	U	U	.	.	U	.

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.	.	.	.	122	ponderosa pine	Pinus	ponderosa	PIPO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	123	Table Mountain pine	Pinus	pungens	PIPU5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	138	four-leaf or Parry pinyon pine	Pinus	quadrifolia	PIQU	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	124	Monterey pine	Pinus	radiata	PIRA2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	w	141	Papershell pinyon pine	Pinus	remota	PIRE5	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	125	red pine	Pinus	resinosa	PIRE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	126	pitch pine	Pinus	rigida	PIRI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8182	Indian longleaf pine	Pinus	roxburghii	PIRO2	U	U	U	U	.	.	U	.
.	.	.	.	127	gray or California foothill pine	Pinus	sabiniana	PISA2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	128	pond pine	Pinus	serotina	PISE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	114	southwestern white pine	Pinus	strobiformis	PIST3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	129	eastern white pine	Pinus	strobus	PIST	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	130	Scotch pine	Pinus	sylvestris	PISY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	131	loblolly pine	Pinus	taeda	PITA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8198	Japansese Black pine	Pinus	thunbergii	PITH2	U	U	U	U	.	.	U	.
.	.	.	.	139	Torrey pine	Pinus	torreyana	PITO	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	132	Virginia pine	Pinus	virginiana	PIVI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	137	Washoe pine	Pinus	washoensis	PIWA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8249	Oriental arborvitae	Platycladus	orientalis	PLOR80	U	U	U	C, U	C	.	.	.
.	.	.	.	8274	yew plum pine	Podocarpus	macrophyllus	POMA32	U	U	U	U	.	.	U	.
.	.	.	.	201	bigcone Douglas-fir	Pseudotsuga	macrocarpa	PSMA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	202	Douglas-fir	Pseudotsuga	menziesii	PSME	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	211	redwood	Sequoia	sempervirens	SESE3	R, U	PNWS, P, U	R, U	U	.	P	.	P2
.	.	.	.	212	giant sequoia	Sequoiadendron	giganteum	SEGI2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	222	pondcypress	Taxodium	ascendens	TAAS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	221	baldcypress	Taxodium	distichum	TADI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	223	Montezuma baldcypress	Taxodium	mucronatum	TAMU	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	8738	English yew	Taxus	baccata	TABA80	U	U	U	U	.	.	U	.
.	.	.	.	231	Pacific yew	Taxus	brevifolia	TABR2	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	8739	Japanese yew	Taxus	cuspidata	TACU	U	U	U	U	.	.	U	.
.	.	.	.	232	Florida yew	Taxus	floridana	TAFL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	241	northern white-cedar	Thuja	occidentalis	THOC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	242	western redcedar	Thuja	plicata	THPL	R, U	PNWS, AK, U	R, U	U	.	.	.	P2

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.	.	.	.	251	California torreya (nutmeg)	Torreya	californica	TOCA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	252	Florida torreya (nutmeg)	Torreya	taxifolia	TOTA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
NUE	.	.	.	299	Unknown dead conifer	Tree	evergreen	2TE	R, U	PNWS, AK, U	R, U	P2, U	.	.	.	P2
.	.	.	.	261	eastern hemlock	Tsuga	canadensis	TSCA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	262	Carolina hemlock	Tsuga	caroliniana	TSCA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	263	western hemlock	Tsuga	heterophylla	TSHE	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	264	mountain hemlock	Tsuga	mertensiana	TSME	R, U	PNWS, AK, U	R, U	U	.	.	.	P2

Hardwoods

.	.	.	.	6001	blackbrush wattle	Acacia	anegadensis	ACAN4	U	U	U	C, U	C	.	.	.
.	.	.	.	6002	mulga	Acacia	aneura	ACAN10	U	P, U	U	U	.	P	.	.
.	.	.	.	6003	auri	Acacia	auriculiformis	ACAU	U	P, U	U	U	.	P	.	.
.	.	.	.	6004	small Philippine acacia	Acacia	confusa	ACCO	U	P, U	U	U	.	P	.	.
.	.	.	.	6016	silver wattle	Acacia	dealbata	ACDE3	U	U	U	U	.	.	U	.
.	.	.	.	6017	green wattle	Acacia	decurrens	ACDE	U	U	U	U	.	.	U	.
.	3	.	w	303	sweet acacia	Acacia	farnesiana	ACFA	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	6006	koa	Acacia	koa	ACKO	U	P, U	U	U	.	P	.	.
.	.	.	.	6007	koaoha	Acacia	koaia	ACKO2	U	P, U	U	U	.	P	.	.
.	.	.	.	6019	Sydney golden wattle	Acacia	longifolia	ACLO	U	U	U	U	.	.	U	.
.	.	.	.	6008	porknut	Acacia	macracantha	ACMA	U	U	U	C, U	C	.	.	.
.	.	.	.	6009	black wattle	Acacia	mangium	ACMA12	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6010	black wattle	Acacia	mearnsii	ACME80	U	P, U	U	U	.	P	.	.
.	.	.	.	6011	blackwood	Acacia	melanoxylon	ACME	U	P, U	U	U	.	P	.	.
.	.	.	.	6012	spineless wattle	Acacia	muricata	ACMU	U	U	U	C, U	C	.	.	.
.	.	.	.	6013	gum arabic tree	Acacia	nilotica	ACNI2	U	U	U	C, U	C	.	.	.
.	.	.	.	6014	South Wales wattle	Acacia	parramattensis	ACPA81	U	P, U	U	U	.	P	.	.
.	.	.	.	6015	Acacia polyacantha	Acacia	polyacantha	ACPO3	U	U	U	C, U	C	.	.	.
NUE	.	.	w	300	acacia spp.	Acacia	spp.	ACACI	R, U	P, U	U	C, U	C	P	.	P2
.	.	.	.	6018	poponax	Acacia	tortuosa	ACTO	U	U	U	C, U	C	.	.	.
.	.	.	.	6020	prickly Moses	Acacia	verticillata	ACVE2	U	U	U	U	.	.	U	.
.	.	.	.	311	Florida maple	Acer	barbatum	ACBA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5145	hedge maple	Acer	campestre	ACCA5	U	U	U	U	.	.	U	.
.	5, 6, 10	.	.	5146	vine maple	Acer	circinatum	ACCI	U	U	U	U	.	.	U	.
.	.	.	.	5147	Amur maple	Acer	ginnala	ACGI	U	U	U	U	.	.	U	.
.	.	.	w	322	bigtooth maple	Acer	grandidentatum	ACGR3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5148	paperbark maple	Acer	griseum	ACGR14	U	U	U	U	.	.	U	.
.	.	.	.	323	chalk maple	Acer	leucoderme	ACLE	R, U	PNWS, U	R, U	R, U	.	.	.	P2

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.	.	.	.	312	bigleaf maple	Acer	macrophyllum	ACMA3	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	5155	Miyabe maple	Acer	miyabei	ACMI7	U	U	U	U	.	.	U	.
.	.	.	.	5149	Painted maple	Acer	mono	ACMO10	U	U	U	U	.	.	U	.
.	.	.	.	313	boxelder	Acer	negundo	ACNE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	314	black maple	Acer	nigrum	ACNI5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5150	Japanese maple	Acer	palmatum	ACPA2	U	U	U	U	.	.	U	.
.	.	.	.	315	striped maple	Acer	pensylvanicum	ACPE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	320	Norway maple	Acer	platanoides	ACPL	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	5157	Norway maple x shantung maple	Acer	platanoides x truncatum	ACPL2	U	U	U	U	.	.	U	.
.	.	.	.	5151	sycamore maple	Acer	pseudoplatanus	ACPS	U	U	U	U	.	.	U	.
.	.	.	.	316	red maple	Acer	rubrum	ACRU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	317	silver maple	Acer	saccharinum	ACSA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	318	sugar maple	Acer	saccharum	ACSA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	319	mountain maple	Acer	spicatum	ACSP2	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	5152	tatarian maple	Acer	tataricum	ACTA80	U	U	U	U	.	.	U	.
.	.	.	.	5156	Three Flower Maple	Acer	triflorum	ACTR7	U	U	U	U	.	.	U	.
.	.	.	.	5154	Freeman maple	Acer	x freemanii	ACFR	U	U	U	U	.	.	U	.
.	.	.	.	6021	hollowheart	Acnistus	arborescens	ACAR	U	U	U	C, U	C	.	.	.
.	.	.	.	906	Everglades palm, paurotis-palm	Acoelorraphe	wrightii	ACWR4	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	6023	grugru palm	Acrocomia	media	ACME2	U	U	U	C, U	C	.	.	.
.	.	.	.	6025	baobab	Adansonia	digitata	ADDI3	U	U	U	C, U	C	.	.	.
.	.	.	.	6026	wild lime	Adelia	ricinella	ADRI	U	U	U	C, U	C	.	.	.
.	.	.	.	6028	red beadtree	Adenanthera	pavonina	ADPA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6032	Caribbean spiritweed	Aegiphila	martinicensis	AEMA	U	U	U	C, U	C	.	.	.
.	.	.	.	333	California buckeye	Aesculus	californica	AECA	R, U	PNWS, U	U	U	.	.	.	P2
.	.	.	.	332	yellow buckeye	Aesculus	flava	AEFL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	331	Ohio buckeye	Aesculus	glabra	AEGL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	334	Texas buckeye	Aesculus	glabra var.arguta	AEGLA	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	5163	horse chestnut	Aesculus	hippocastanum	AEHI	U	U	U	U	.	.	U	.
.	.	.	.	5164	bottlebrush buckeye	Aesculus	parviflora	AEPA2	U	U	U	U	.	.	U	.
.	.	.	.	6034	yellowwood	Afrocarpus	falcatus	AFFA	U	U	U	U	.	.	U	.
.	.	.	.	6035	East African yellowwood	Afrocarpus	gracilior	AFGR	U	U	U	U	.	.	U	.
.	.	.	.	6036	kauri	Agathis	australis	AGAU4	U	U	U	C, U	C	.	.	.
.	.	.	.	6037	Queensland kauri	Agathis	robusta	AGRO6	U	U	U	C, U	C	.	.	.
.	.	.	.	6042	Titimel	Aglaia	mariannensis	AGMA14	U	P, U	U	U	.	P	.	.
.	.	.	.	6044	karasyu, marasau	Aglaia	ponapensis	AGPO4	U	P, U	U	U	.	P	.	.
.	.	.	.	6046	laga ali	Aglaia	samoensis	AGSA9	U	P, U	U	U	.	P	.	.
.	.	.	.	6048	Olomea	Aidia	cochinchinensis	AICO2	U	P, U	U	U	.	P	.	.

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.	.	.	.	6049	Aidia racemosa	Aidia	racemosa	AIRA2	U	P, U	U	U	.	P	.	.
.	.	.	.	341	ailanthus	Ailanthus	altissima	AIAL	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
.	.	.	.	6053	Aiphanes minima	Aiphanes	minima	AIMI	U	U	U	C, U	C	.	.	.
.	.	.	.	6055	cream albizia	Albizia	adinocephala	ALAD	U	U	U	C, U	C	.	.	.
.	.	.	.	6056	naked albizia	Albizia	carbonaria	ALCA8	U	U	U	C, U	C	.	.	.
.	.	.	.	6057	Chinese albizia	Albizia	chinensis	ALCH2	U	P, U	U	U	.	P	.	.
.	.	.	.	345	mimosa, silktree	Albizia	julibrissin	ALJU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6059	woman's tongue	Albizia	lebbeck	ALLE	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6060	tall albizia	Albizia	procera	ALPR	U	U	U	C, U	C	.	.	.
.	.	.	.	6061	ukall ra ngebard	Albizia	retusa	ALRE	U	P, U	U	U	.	P	.	.
.	.	.	.	6062	whiteflower albizia	Albizia	saponaria	ALSA10	U	P, U	U	U	.	P	.	.
.	.	.	.	6064	achiotillo	Alchornea	latifolia	ALLA	U	U	U	C, U	C	.	.	.
.	.	.	.	6066	palo de gallina	Alchorneopsis	floribunda	ALFL3	U	U	U	C, U	C	.	.	.
.	.	.	.	6069	Hawaii alectryon	Alectryon	macrococcus	ALMA	U	P, U	U	U	.	P	.	.
.	.	.	.	6075	Indian walnut	Aleurites	moluccana	ALMO2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6078	lumbang	Aleurites	trisperma	ALTR11	U	P, U	U	U	.	P	.	.
.	.	.	.	6080	palo blanco	Allophylus	crassinervis	ALCR9	U	U	U	C, U	C	.	.	.
.	.	.	.	6082	palo de caja	Allophylus	racemosus	ALRA	U	U	U	C, U	C	.	.	.
.	.	.	.	6084	chebeludes	Allophylus	ternatus	ALTE13	U	P, U	U	U	.	P	.	.
.	.	.	.	6085	ebeludes, chebeludes	Allophylus	timorensis	ALTI2	U	P, U	U	U	.	P	.	.
.	.	.	.	5189	Italian alder	Alnus	cordata	ALCO13	U	U	U	U	.	.	U	.
.	.	.	.	355	European alder	Alnus	glutinosa	ALGL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
NUE	.	.	.	5188	gray alder	Alnus	incana	ALIN2	U	U	.	U	.	.	U	.
.	.	.	.	6086	Nepal alder	Alnus	nepalensis	ALNE2	U	P, U	U	U	.	P	U	.
.	.	.	.	353	Arizona alder	Alnus	oblongifolia	ALOB2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	352	white alder	Alnus	rhombifolia	ALRH2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	351	red alder	Alnus	rubra	ALRU2	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
NUE	.	.	.	5192	green alder	Alnus	viridis	ALVI5	U	U	.	U	.	.	U	.
.	.	.	.	6088	chelebiob, elebiong	Alphitonia	carolinensis	ALCA21	U	P, U	U	U	.	P	.	.
.	.	.	.	6089	Hawaii kauilatree	Alphitonia	ponderosa	ALPO3	U	P, U	U	U	.	P	.	.
.	.	.	.	6091	toi	Alphitonia	zizyphoides	ALZI	U	P, U	U	U	.	P	.	.
.	.	.	.	6092	helecho gigante de la sierra	Alsophila	bryophila	ALBR4	U	U	U	C, U	C	.	.	.
.	.	.	.	6093	Alsophila portoricensis	Alsophila	portoricensis	ALPO7	U	U	U	C, U	C	.	.	.
.	.	.	.	6095	deviltree	Alstonia	macrophylla	ALMA16	U	P, U	U	U	.	P	.	.
.	.	.	.	6096	Alstonia pacifica	Alstonia	pacifica	ALPA22	U	P, U	U	U	.	P	.	.
.	.	.	.	357	common serviceberry	Amelanchier	arborea	AMAR3	.	U	U	U	.	.	.	P2
.	.	.	.	5203	Allegheny serviceberry	Amelanchier	laevis	AMLA	.	U	U	U	.	.	U	.

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.	.	.	.	358	roundleaf serviceberry	Amelanchier	sanguinea	AMSA	.	U	U	U	.	.	.	P2
.	5 ,6, 10	.	.	356	serviceberry spp.	Amelanchier	spp.	AMELA	R, U	U	.	R, U	.	.	.	P2
.	.	.	.	6101	black calabash	Amphitecna	latifolia	AMLA4	U	U	U	C, U	C	.	.	.
.	.	.	.	6103	balsam torchwood	Amyris	balsamifera	AMBA2	U	U	U	C, U	C	.	.	.
.	.	.	.	852	sea torchwood	Amyris	elemifera	AMEL	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	6107	cashew	Anacardium	occidentale	ANOC	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6106	anacardium	Anacardium	spp.	ANACA	U	U	U	C, U	C	.	.	.
.	.	.	.	6108	Anacolosa glochidiiformis	Anacolosa	glochidiiformis	ANGL5	U	P, U	U	U	.	P	.	.
.	.	.	.	6109	Anacolosa insularis	Anacolosa	insularis	ANIN13	U	P, U	U	U	.	P	.	.
.	.	.	.	6111	Anadenanthera peregrina	Anadenanthera	peregrina	ANPE13	U	U	U	C, U	C	.	.	.
.	.	.	.	6114	cabbagebark tree	Andira	inermis	ANIN	U	U	U	C, U	C	.	.	.
.	.	.	.	6120	canelillo	Aniba	bracteata	ANBR7	U	U	U	C, U	C	.	.	.
.	.	.	.	6124	Annona cherimola	Annona	cherimola	ANCH9	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6125	ilama	Annona	diversifolia	ANDI11	U	U	U	C, U	C	.	.	.
.	.	.	.	853	pond-apple	Annona	glabra	ANGL4	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	6127	mountain soursop	Annona	montana	ANMO	U	U	U	C, U	C	.	.	.
.	.	.	.	6128	soursop	Annona	muricata	ANMU2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6129	custard apple	Annona	reticulata	ANRE	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6131	sugar apple	Annona	squamosa	ANSQ	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6137	Antidesma bunius	Antidesma	bunius	ANBU3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6138	Antidesma kusaiense	Antidesma	kusaiense	ANKU3	U	P, U	U	U	.	P	.	.
.	.	.	.	6135	Kapua china laurel	Antidesma	kapuae	ANKA	U	P, U	U	U	.	P	.	.
.	.	.	.	6139	ha a	Antidesma	platyphyllum	ANPL2	U	P, U	U	U	.	P	.	.
.	.	.	.	6143	hame	Antidesma	pulvinatum	ANPU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6146	placa chiquitu	Antirhea	acutata	ANAC4	U	U	U	C, U	C	.	.	.
.	.	.	.	6147	pegwood	Antirhea	coriacea	ANCO3	U	U	U	C, U	C	.	.	.
.	.	.	.	6148	Antirhea inconspicua	Antirhea	inconspicua	ANIN2	U	P, U	U	U	.	P	.	.
.	.	.	.	6149	palo iloron	Antirhea	lucida	ANLU3	U	U	U	C, U	C	.	.	.
.	.	.	.	6150	quina roja	Antirhea	obtusifolia	ANOB2	U	U	U	C, U	C	.	.	.
.	.	.	.	6151	Puerto Rico quina	Antirhea	portoricensis	ANPO3	U	U	U	C, U	C	.	.	.
.	.	.	.	6152	Sintenis' quina	Antirhea	sintenisii	ANSI	U	U	U	C, U	C	.	.	.
.	.	.	.	5232	Japanese angelica tree	Aralia	elata	AREL8	U	U	U	U	.	.	U	.
.	.	.	.	6154	parana pine	Araucaria	angustifolia	ARAN15	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6157	Norfolk Island pine	Araucaria	heterophylla	ARHE12	U	P, U	U	C, U	C	P	.	.
.	.	.	.	362	Arizona madrone	Arbutus	arizonica	ARAR2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	361	Pacific madrone	Arbutus	menziesii	ARME	R, U	PNWS, U	R, U	U	.	.	.	P2

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.	.	.	.	6180	strawberry tree	Arbutus	unedo	ARUN4	.	U	U	U	.	.	U	.
.	.	.	w	363	Texas madrone	Arbutus	xalapensis	ARXA80	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	6159	Alexandra palm	Archontophoenix	alexandrae	ARAL	U	P, U	U	U	.	P	.	.
.	.	.	.	6160	Bangalow palm	Archontophoenix	cunninghamiana	ARCU2	U	U	U	U	.	.	U	.
.	.	.	.	6161	shoebutton	Ardisia	elliptica	AREL4	U	P, U	U	U	.	P	.	.
.	.	.	.	6162	ausubon	Ardisia	glauciflora	ARGL11	U	U	U	C, U	C	.	.	.
.	.	.	.	6163	mountain marlberry	Ardisia	luquillensis	ARLU3	U	U	U	C, U	C	.	.	.
.	.	.	.	6164	Guadeloupe marlberry	Ardisia	obovata	AROB2	U	U	U	C, U	C	.	.	.
.	.	.	.	6165	China-shrub	Ardisia	solanacea	ARSO	U	U	U	C, U	C	.	.	.
.	.	.	.	6167	betelnut	Areca	catechu	ARCA41	U	P, U	U	U	.	P	.	.
.	.	.	.	6169	cabo-negro	Arenga	pinnata	ARPI6	U	P, U	U	U	.	P	.	.
.	.	.	.	6171	breadfruit	Artocarpus	altilis	ARAL7	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6173	Artocarpus heterophyllus	Artocarpus	heterophyllus	ARHE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6175	dugdug, Marianas breadfruit	Artocarpus	mariannensis	ARMA28	U	P, U	U	U	.	P	.	.
.	.	.	.	6176	Artocarpus nobilis	Artocarpus	nobilis	ARNO	U	P, U	U	U	.	P	.	.
.	.	.	.	6177	Marang	Artocarpus	odoratissimus	AROD2	U	P, U	U	U	.	P	.	.
.	.	.	.	6179	taputoi	Arytera	brackenridgei	ARBR11	U	P, U	U	U	.	P	.	.
.	.	.	.	6181	afia	Ascarina	diffusa	ASDI14	U	P, U	U	U	.	P	.	.
.	.	.	.	5256	smallflower pawpaw	Asimina	parviflora	ASPA18	U	U	U	U	.	.	U	.
.	.	.	.	367	pawpaw	Asimina	triloba	ASTR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6184	Astronidium kusaianum	Astronidium	kusaianum	ASKU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6185	Astronidium navigatorum	Astronidium	navigatorum	ASNA10	U	P, U	U	U	.	P	.	.
.	.	.	.	6186	meskui	Astronidium	palauense	ASPA37	U	P, U	U	U	.	P	.	.
.	.	.	.	6187	Astronidium pickeringii	Astronidium	pickeringii	ASPI11	U	P, U	U	U	.	P	.	.
.	.	.	.	6188	Astronidium samoense	Astronidium	samoense	ASSA23	U	P, U	U	U	.	P	.	.
.	.	.	.	6190	Astronidium subcordata	Astronidium	subcordata	ASSU31	U	P, U	U	U	.	P	.	.
.	.	.	.	6193	ifi ifi	Atuna	racemosa	ATRA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6197	Bilimbi	Averrhoa	bilimbi	AVBI	U	P, U	U	U	.	P	.	.
.	.	.	.	6198	carambola	Averrhoa	carambola	AVCA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	986	black-mangrove	Avicennia	germinans	AVGE	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	6203	Avicennia marina	Avicennia	marina	AVMA3	U	P, U	U	U	.	P	.	.
.	.	.	.	6200	biut	Avicennia	Marina ssp.Marina	AVAL	U	P, U	U	U	.	P	.	.
.	.	.	.	6206	neem	Azadirachta	indica	AZIN2	U	P, U	U	C, U	C	.	.	.
.	.	.	.	6208	Saitamu	Baccaurea	taitensis	BATA	U	P, U	U	U	.	P	.	.
.	.	.	.	5260	eastern baccharis	Baccharis	halimifolia	BAHA	U	U	U	U	.	.	U	.

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.	.	.	.	5261	peach palm	Bactris	gasipaes	BAGA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6213	ralm	Badusa	palauensis	BAPA8	U	P, U	U	U	.	P	.	.
.	.	.	.	6217	Puerto Rico palo de ramon	Banara	portoricensis	BAPO	U	U	U	C, U	C	.	.	.
.	.	.	.	6219	Vanderbilt's palo de ramon	Banara	vanderbiltii	BAVA2	U	U	U	C, U	C	.	.	.
.	.	.	.	6220	sea putat	Barringtonia	asiatica	BAAS3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6221	langaasag	Barringtonia	racemosa	BARA5	U	P, U	U	U	.	P	.	.
.	.	.	.	6222	falaga	Barringtonia	samoensis	BASA9	U	P, U	U	U	.	P	.	.
.	.	.	.	6224	Bastardiopsis eggersii	Bastardiopsis	eggersii	BAEG6	U	U	U	C, U	C	.	.	.
.	.	.	.	6241	Texasplume	Bauhinia	lunarioides	BALU	U	U	U	U	.	.	U	.
.	.	.	.	6226	Napoleon's plume	Bauhinia	monandra	BAMO2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6227	petite flamboyant bauhinia	Bauhinia	multinervia	BAMU3	U	U	U	C, U	C	.	.	.
.	.	.	.	6228	railroadfence	Bauhinia	pauletia	BAPA3	U	U	U	C, U	C	.	.	.
.	.	.	.	6229	butterfly tree	Bauhinia	purpurea	BAPU	U	U	U	C, U	C	.	.	.
.	.	.	.	6231	St. Thomas tree	Bauhinia	tomentosa	BATO	U	U	U	C, U	C	.	.	.
.	.	.	.	6232	mountain ebony	Bauhinia	variegata	BAVA	U	U	U	C, U	C	.	.	.
.	.	.	.	6252	bauhinia	Bauhinia	x blakeana	BABL	U	U	U	U	.	.	U	.
.	.	.	.	6233	slugwood	Beilschmiedia	pendula	BEPE	U	U	U	C, U	C	.	.	.
.	.	.	.	6235	Caribbean myrtlecroton	Bernardia	dichotoma	BEDI2	U	U	U	C, U	C	.	.	.
.	.	.	.	371	yellow birch	Betula	alleghaniensis	BEAL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	372	sweet birch	Betula	lenta	BELE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	376	resin birch	Betula	neoalaskana	BENE4	R, U	AK	R, U	U	.	.	.	P2
.	.	.	.	373	river birch	Betula	nigra	BENI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	374	water birch	Betula	occidentalis	BEOC2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	375	paper birch	Betula	papyrifera	BEPA	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
.	.	.	.	5279	European white birch	Betula	pendula	BEPE3	U	U	U	U	.	.	U	.
.	.	.	.	5280	Asian white birch	Betula	platyphylla	BEPL2	U	U	U	U	.	.	U	.
.	.	.	.	379	gray birch	Betula	populifolia	BEPO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5281	downy birch	Betula	pubescens	BEPU5	U	U	U	U	.	.	U	.
.	.	.	.	377	Virginia roundleaf birch	Betula	uber	BEUB	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	378	northwestern paper birch	Betula	x utahensis	BEUT	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	6236	Javanese bishopwood	Bischofia	javanica	BIJA	U	P, U	U	U	.	P	.	.
.	.	.	.	6238	lipsticktree	Bixa	orellana	BIOR	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6240	akee	Blighia	sapida	BLSA2	U	U	U	C, U	C	.	.	.
.	.	.	.	6242	akupa	Bobea	brevipes	BOBR3	U	P, U	U	U	.	P	.	.

Non-Urban Exclu-sion	NFS Region Exclu-sion	Main-land Exclu-sion	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
.	.	.	.	6243	ahakea lau nui	Bobea	elatior	BOEL3	U	P, U	U	U	.	P	.	.
.	.	.	.	6244	Hawaii dogweed	Bobea	sandwicensis	BOSA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6246	ahakea	Bobea	timonioides	BOTI	U	P, U	U	U	.	P	.	.
.	.	.	.	6247	parrotweed	Bocconia	frutescens	BOFR2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6250	virgata	Boehmeria	virgata	BOVI7	U	P, U	U	U	.	P	.	.
.	.	.	.	6251	white alling	Bontia	daphnoides	BODA	U	U	U	C, U	C	.	.	.
.	.	.	.	6253	Bourreria radula	Bourreria	radula	BORA2	U	U	U	C, U	C	.	.	.
.	.	.	.	6255	bodywood	Bourreria	succulenta	BOSU2	U	U	U	C, U	C	.	.	.
.	.	.	.	6257	roble de guayo	Bourreria	virgata	BOVI2	U	U	U	C, U	C	.	.	.
.	.	.	.	6258	pink flame tree	Brachychiton	discolor	BRDI6	U	U	U	U	.	.	U	.
.	.	.	.	6259	whiteflower kurrajong	Brachychiton	populneum	BRPO6	U	U	U	U	.	.	U	.
.	.	.	.	6262	paper mulberry	Broussonetia	papyrifera	BRPA4	U	P, U	U	U	.	P	U	.
.	.	.	.	6264	angels-trumpet	Brugmansia	candida	BRCA12	U	P, U	U	U	.	P	.	.
.	.	.	.	6266	Oriental mangrove	Bruguiera	gymnorhiza	BRGY3	U	P, U	U	U	.	P	.	.
.	.	.	.	6267	smallflower bruguiera	Bruguiera	parviflora	BRPA15	U	P, U	U	U	.	P	.	.
.	.	.	.	6270	West Indian sumac	Brunellia	comocladiifolia	BRCO6	U	U	U	C, U	C	.	.	.
.	.	.	.	6272	American brunfelsia	Brunfelsia	americana	BRAM4	U	U	U	C, U	C	.	.	.
.	.	.	.	6273	Serpentine Hill raintree	Brunfelsia	densifolia	BRDE4	U	U	U	C, U	C	.	.	.
.	.	.	.	6274	vega blanca	Brunfelsia	lactea	BRLA5	U	U	U	C, U	C	.	.	.
.	.	.	.	6275	Puerto Rico raintree	Brunfelsia	portoricensis	BRPO3	U	U	U	C, U	C	.	.	.
.	.	.	.	6277	omail	Buchanania	engleriana	BUEN	U	P, U	U	U	.	P	.	.
.	.	.	.	6278	gasu	Buchanania	merrillii	BUME4	U	P, U	U	U	.	P	.	.
.	.	.	.	6279	omail, deuachel	Buchanania	palawensis	BUPA16	U	P, U	U	U	.	P	.	.
.	.	.	.	6283	fourleaf buchenavia	Buchenavia	tetraphylla	BUTE4	U	U	U	C, U	C	.	.	.
.	.	.	.	6284	gregorywood	Bucida	buceras	BUBU	U	U	U	C, U	C	.	.	.
.	.	.	.	6294	cafe falso	Bunchosia	glandulifera	BUGL2	U	U	U	C, U	C	.	.	.
.	.	.	.	6295	cafe forastero	Bunchosia	glandulosa	BUGL	U	U	U	C, U	C	.	.	.
.	.	.	.	6297	Bunchosia polystachia	Bunchosia	polystachia	BUPO5	U	U	U	C, U	C	.	.	.
.	.	.	.	6299	Burckella richii	Burckella	richii	BURI3	U	P, U	U	U	.	P	.	.
.	.	.	.	854	gumbo limbo	Bursera	simaruba	BUSI	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	5328	South American jelly palm	Butia	capitata	BUCA15	.	.	.	.	.	.	.	.
.	.	.	.	6303	Buxus laevigata	Buxus	laevigata	BULA10	U	U	U	C, U	C	.	.	.
.	.	.	.	5329	common box	Buxus	sempervirens	BUSE2	U	U	U	U	.	.	U	.
.	.	.	.	6306	Vahl's box	Buxus	vahlii	BUVA	U	U	U	C, U	C	.	.	.
.	.	.	.	6308	maricao cimun	Byrsonima	crassifolia	BYCR	U	U	U	C, U	C	.	.	.
.	.	.	.	6311	Long Key locustberry	Byrsonima	lucida	BYLU	U	U	U	C, U	C	.	.	.
.	.	.	.	6313	doncella	Byrsonima	spicata	BYSP	U	U	U	C, U	C	.	.	.

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.	.	.	.	6315	almendrillo	Byrsonima	wadsworthii	BYWA	U	U	U	C, U	C	.	.	.
.	.	.	.	6317	divi divi	Caesalpinia	coriaria	CACO28	U	U	U	C, U	C	.	.	.
.	.	.	.	6318	uhiuhi	Caesalpinia	kavaiensis	CAKA5	U	P, U	U	U	.	P	.	.
.	.	.	.	6319	pride-of-Barbados	Caesalpinia	pulcherrima	CAPU13	U	U	U	C, U	C	.	.	.
.	.	.	.	6320	sappanwood	Caesalpinia	sappan	CASA28	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6316	nicker	Caesalpinia	spp.	CAESA	U	U	U	C, U	C	.	.	.
.	.	.	.	6325	Surinamese stickpea	Calliandra	surinamensis	CASU33	U	U	U	C, U	C	.	.	.
.	.	.	.	6326	caparosa	Callicarpa	ampla	CAAM14	U	U	U	C, U	C	.	.	.
.	.	.	.	6328	crimson bottlebrush	Callistemon	citrinus	CACI15	U	U	U	C, U	C	.	.	.
.	.	.	.	6329	weeping bottlebrush	Callistemon	viminalis	CAVI23	U	P, U	U	U	.	P	U	.
.	.	.	.	6338	Antilles calophyllum	Calophyllum	antillanum	CAAN22	U	U	U	C, U	C	.	.	.
.	.	.	.	6341	Alexandrian laurel	Calophyllum	inophyllum	CAIN4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6342	tamanu	Calophyllum	neo-ebudicum	CANE31	U	P, U	U	U	.	P	.	.
.	.	.	.	6343	chesemolech	Calophyllum	pelewense	CAPE15	U	P, U	U	U	.	P	.	.
.	.	.	.	6344	olebtaches, chesemolech	Calophyllum	soulattri	CASO12	U	P, U	U	U	.	P	.	.
.	.	.	.	6346	roostertree	Calotropis	procera	CAPR	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6350	degame	Calycophyllum	candidissimum	CACA73	U	U	U	C, U	C	.	.	.
.	.	.	.	6351	Kiaerskov's lidflower	Calyptranthes	kiaerskovii	CAKI	U	U	U	C, U	C	.	.	.
.	.	.	.	6352	limoncillo	Calyptranthes	krugii	CAKR	U	U	U	C, U	C	.	.	.
.	.	.	.	6353	Luquillo forest lidflower	Calyptranthes	luquillensis	CALU12	U	U	U	C, U	C	.	.	.
.	.	.	.	6354	pale lidflower	Calyptranthes	pallens	CAPA8	U	U	U	C, U	C	.	.	.
.	.	.	.	6355	Puerto Rico lidflower	Calyptranthes	portoricensis	CAPO9	U	U	U	C, U	C	.	.	.
.	.	.	.	6356	limoncillo de monte	Calyptranthes	sintenisii	CASI8	U	U	U	C, U	C	.	.	.
.	.	.	.	6358	Thomas' lidflower	Calyptranthes	thomasiana	CATH3	U	U	U	C, U	C	.	.	.
.	.	.	.	6359	myrtle of the river	Calyptranthes	zuzygium	CAZU	U	U	U	C, U	C	.	.	.
.	.	.	.	6360	Puerto Rico manac	Calyptronoma	rivalis	CARI3	U	U	U	C, U	C	.	.	.
.	.	.	.	5363	camellia	Camellia	japonica	CAJA9	U	U	U	U	.	.	U	.
.	.	.	.	5364	tea	Camellia	sinensis	CASI16	U	U	U	U	.	.	U	.
.	.	.	.	6366	kelela charm, kiu	Campnosperma	brevipetiolatum	CABR18	U	P, U	U	U	.	P	.	.
.	.	.	.	6370	ilang-ilang	Cananga	odorata	CAOD	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6373	mesecheues	Canarium	hirsutum	CAHI14	U	P, U	U	U	.	P	.	.
.	.	.	.	6374	lukerr	Canarium	indicum	CAIN42	U	P, U	U	U	.	P	.	.
.	.	.	.	6372	mafoa	Canarium	mafoa	CAHA39	U	P, U	U	U	.	P	.	.
.	.	.	.	6375	Pili Nut	Canarium	ovatum	CAOV7	U	P, U	U	U	.	P	.	.
.	.	.	.	6378	maali	Canarium	vitiense	CAVI26	U	P, U	U	U	.	P	.	.
.	.	.	.	6379	Canarium vulgare	Canarium	vulgare	CAVU9	U	P, U	U	U	.	P	.	.
.	.	.	.	6380	wild cinnamon	Canella	winteriana	CAWI	U	U	U	C, U	C	.	.	.
.	.	.	.	6383	burro blanco	Capparis	amplissima	CAAM13	U	U	U	C, U	C	.	.	.

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.	.	.	.	6384	caper	Capparis	baducca	CABA2	U	U	U	C, U	C	.	.	.
.	.	.	.	6386	Jamaican caper	Capparis	cynophallophora	CACY	U	U	U	C, U	C	.	.	.
.	.	.	.	6387	falseteeth	Capparis	flexuosa	CAFL2	U	U	U	C, U	C	.	.	.
.	.	.	.	6389	broadleaf caper	Capparis	hastata	CAHA9	U	U	U	C, U	C	.	.	.
.	.	.	.	6390	linguam	Capparis	indica	CAIN5	U	U	U	C, U	C	.	.	.
.	.	.	.	5375	Siberian peashrub	Caragana	arborescens	CAAR18	U	U	U	U	.	.	U	.
.	.	.	.	6393	crabwood	Carapa	guianensis	CAGU6	U	U	U	C, U	C	.	.	.
.	.	.	.	6395	papaya	Carica	papaya	CAPA23	U	U	U	C, U	C	.	.	.
.	.	.	.	6397	scorpionbush	Carmona	retusa	CARE22	U	P, U	U	U	.	P	.	.
.	.	.	.	5378	European hornbeam	Carpinus	betulus	CABE8	U	U	U	U	.	.	U	.
.	.	.	.	391	American hornbeam, musclewood	Carpinus	caroliniana	CACA18	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	409	mockernut hickory	Carya	alba	CAAL27	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	401	water hickory	Carya	aquatica	CAAQ2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	413	southern shagbark hickory	Carya	carolinae-septentrionalis	CACA38	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	402	bitternut hickory	Carya	cordiformis	CACO15	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	411	scrub hickory	Carya	floridana	CAFL6	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	403	pignut hickory	Carya	glabra	CAGL8	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	404	pecan	Carya	illinoinensis	CAIL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	405	shellbark hickory	Carya	laciniosa	CALA21	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	406	nutmeg hickory	Carya	myristiciformis	CAMY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	412	red hickory	Carya	ovalis	CAOV3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	407	shagbark hickory	Carya	ovata	CAOV2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	410	sand hickory	Carya	pallida	CAPA24	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	408	black hickory	Carya	texana	CATE9	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6399	fish tail palm	Caryota	mitis	CAMI36	U	P, U	U	U	.	P	.	.
.	.	.	.	6401	fishtail palm	Caryota	urens	CAUR3	U	P, U	U	U	.	P	.	.
.	.	.	.	6402	rabo de ranton	Casearia	aculeata	CAAC3	U	U	U	C, U	C	.	.	.
.	.	.	.	6403	gia verde	Casearia	arborea	CAAR8	U	U	U	C, U	C	.	.	.
.	.	.	.	6405	keuert	Casearia	cauliflora	CACA28	U	P, U	U	U	.	P	.	.
.	.	.	.	6406	wild honeytree	Casearia	decandra	CADE11	U	U	U	C, U	C	.	.	.
.	.	.	.	6407	Guyanese wild coffee	Casearia	guianensis	CAGU2	U	U	U	C, U	C	.	.	.
.	.	.	.	6410	crackopen	Casearia	sylvestris	CASY2	U	U	U	C, U	C	.	.	.
.	.	.	.	6415	golden shower	Cassia	fistula	CAFI3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6417	pink shower	Cassia	grandis	CAGR11	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6418	apple blossom	Cassia	javanica	CAJA3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6419	gold medallion tree	Cassia	leptophylla	CALE49	U	U	U	U	.	.	U	.
.	.	.	.	6425	marbletree	Cassine	xylocarpa	CAXY	U	U	U	C, U	C	.	.	.
.	.	.	.	6427	goatwood	Cassipourea	guianensis	CAGU3	U	U	U	C, U	C	.	.	.
.	.	.	.	5401	Japanese chestnut	Castanea	crenata	CACR27	U	U	U	U	.	.	U	.

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.	.	.	.	421	American chestnut	Castanea	dentata	CADE12	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	424	Chinese chestnut	Castanea	mollissima	CAMO83	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	422	Allegheny chinkapin	Castanea	pumila	CAPU9	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	423	Ozark chinkapin	Castanea	pumila var. ozarkensis	CAPUO	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	5402	European chestnut	Castanea	sativa	CASA27	U	U	U	U	.	.	U	.
.	.	.	.	6429	goatbush	Castela	erecta	CAER3	U	U	U	C, U	C	.	.	.
.	.	.	.	6430	Panama rubbertree	Castilla	elastica	CAEL5	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6433	river sheoak	Casuarina	cunninghamiana	CACU8	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6434	beach sheoak	Casuarina	equisetifolia	CAEQ	U	P, U	U	C, U	C	P	.	.
.	.	.	.	856	gray sheoak	Casuarina	glauca	CAGL11	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	857	belah	Casuarina	lepidophloia	CALE28	R, U	PNWS, U	R, U	R, C, U	C	.	.	P2
.	.	.	.	451	southern catalpa	Catalpa	bignonioides	CABI8	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6439	Haitian catalpa	Catalpa	longissima	CALO8	U	P, U	U	C, U	C	P	.	.
.	.	.	.	5411	Chinese catalpa	Catalpa	ovata	CAOV5	U	U	U	U	.	.	U	.
.	.	.	.	452	northern catalpa	Catalpa	speciosa	CASP8	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6441	trumpet tree	Cecropia	obtusifolia	CEOB	U	P, U	U	U	.	P	.	.
.	.	.	.	6443	pumpwood	Cecropia	schreberiana	CESC9	U	U	U	C, U	C	.	.	.
.	.	.	.	6445	Spanish cedar	Cedrela	odorata	CEOD	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6447	pochote	Ceiba	acuminata	CEAC4	U	U	U	C, U	C	.	.	.
.	.	.	.	6448	pochote	Ceiba	aesculifolia	CEAE2	U	U	U	C, U	C	.	.	.
.	.	.	.	6449	kapoktree	Ceiba	pentandra	CEPE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	461	sugarberry	Celtis	laevigata	CELA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	462	hackberry	Celtis	occidentalis	CEOC	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6452	Celtis paniculata	Celtis	paniculata	CEPA6	U	P, U	U	U	.	P	.	.
.	.	.	.	6458	Chinese hackberry	Celtis	sinensis	CESI8	U	U	U	U	.	.	U	.
.	.	.	.	6454	almex	Celtis	trinervia	CETR3	U	U	U	C, U	C	.	.	.
.	.	.	.	6457	St. John's bread	Ceratonia	siliqua	CESI3	U	U	U	C, U	C	.	.	.
.	.	.	.	6460	emeridech	Cerbera	floribunda	CEFL2	U	P, U	U	U	.	P	.	.
.	.	.	.	6461	leva	Cerbera	manghas	CEMA20	U	P, U	U	U	.	P	.	.
.	.	.	.	6462	chiute	Cerbera	odollam	CEOD2	U	P, U	U	U	.	P	.	.
.	.	.	.	5435	katsura tree	Cercidiphyllum	japonicum	CEJA2	U	U	U	U	.	.	U	.
.	.	.	.	471	eastern redbud	Cercis	canadensis	CECA4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
NUE	.	.	.	5436	California redbud	Cercis	orbiculata	CEOR9	U	U	U	U	.	.	U	.
.	5, 6	.	w	475	curlleaf mountain-mahogany	Cercocarpus	ledifolius	CELE3	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	6468	lady of the night cactus	Cereus	hexagonus	CEHE3	U	U	U	C, U	C	.	.	.
.	.	.	.	6469	Cereus hildmannianus	Cereus	hildmannianus	CEHI3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6472	biut	Ceriops	tagal	CETA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6473	orange jessamine	Cestrum	aurantiacum	CEAU2	U	P, U	U	U	.	P	.	.

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.	.	.	.	6474	day jessamine	Cestrum	diurnum	CEDI6	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6475	galen del monte	Cestrum	laurifolium	CELA2	U	U	U	C, U	C	.	.	.
.	.	.	.	6477	night jessamine	Cestrum	nocturnum	CENO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6480	European fan palm	Chamaerops	humilis	CHHU7	U	U	U	U	.	.	U	.
.	.	.	.	6481	jointed sandmat	Chamaesyce	articulata	CHAR8	U	U	U	C, U	C	.	.	.
.	.	.	.	6482	koko	Chamaesyce	atrococca	CHAT2	U	P, U	U	U	.	P	.	.
.	.	.	.	6483	ekoko	Chamaesyce	celastroides	CHCE	U	P, U	U	U	.	P	.	.
.	.	.	.	6492	Herbsts sandmat	Chamaesyce	herbstii	CHHE3	U	P, U	U	U	.	P	.	.
.	.	.	.	6493	kokomalei	Chamaesyce	kuwaleana	CHKU	U	P, U	U	U	.	P	.	.
.	.	.	.	6494	alpine sandmat	Chamaesyce	olowaluana	CHOL3	U	P, U	U	U	.	P	.	.
.	.	.	.	6495	Koolau Range sandmat	Chamaesyce	rockii	CHRO2	U	P, U	U	U	.	P	.	.
.	.	.	.	6497	Napali coast papala	Charpentiera	densiflora	CHDE3	U	P, U	U	U	.	P	.	.
.	.	.	.	6498	ellipticleaf papala	Charpentiera	elliptica	CHEL	U	P, U	U	U	.	P	.	.
.	.	.	.	6499	broadleaf papala	Charpentiera	obovata	CHOB2	U	P, U	U	U	.	P	.	.
.	.	.	.	6500	Koolau Range papala	Charpentiera	ovata	CHOV2	U	P, U	U	U	.	P	.	.
.	.	.	.	6504	Waianae Range papala	Charpentiera	tomentosa	CHTO3	U	P, U	U	U	.	P	.	.
.	.	.	.	6507	Domins club	Cheirodendron	dominii	CHDO3	U	P, U	U	U	.	P	.	.
.	.	.	.	6508	Fauries club	Cheirodendron	fauriei	CHFA	U	P, U	U	U	.	P	.	.
.	.	.	.	6509	olapa	Cheirodendron	forbesii	CHFO4	U	P, U	U	U	.	P	.	.
.	.	.	.	6510	lapalapa	Cheirodendron	platyphyllum	CHPL	U	P, U	U	U	.	P	.	.
.	.	.	.	6514	olapalapa	Cheirodendron	trigynum	CHTR2	U	P, U	U	U	.	P	.	.
.	.	.	.	6517	alaweo	Chenopodium	oahuense	CHOA	U	P, U	U	U	.	P	.	.
.	.	.	.	6519	hueso	Chionanthus	axilliflorus	CHAX2	U	U	U	C, U	C	.	.	.
.	.	.	.	6520	bridgotree	Chionanthus	compactus	CHCO12	U	U	U	C, U	C	.	.	.
.	.	.	.	6521	white rosewood	Chionanthus	domingensis	CHDO4	U	U	U	C, U	C	.	.	.
.	.	.	.	6522	hueso prieto	Chionanthus	holdridgei	CHHO4	U	U	U	C, U	C	.	.	.
.	.	.	.	6523	cabra blanca	Chionanthus	ligustrinus	CHLI6	U	U	U	C, U	C	.	.	.
NUE	.	.	.	6524	Chinese fringetree	Chionanthus	retusus	CHRE9	.	U	U	U	.	.	U	.
.	.	.	.	6525	vitiensis	Chionanthus	vitiensis	CHVI22	U	P, U	U	U	.	P	.	.
.	.	.	.	6526	puntaj jayuya	Chione	seminervis	CHSE5	U	U	U	C, U	C	.	.	.
.	.	.	.	6528	fatpork	Chione	venosa	CHVE4	U	U	U	C, U	C	.	.	.
.	.	.	.	6529	african teak	Chlorophora	excelsa	CHEX5	U	U	U	C, U	C	.	.	.
.	.	.	.	6532	silk-floss tree	Chorisia	speciosa	CHSP13	U	U	U	C, U	C	.	.	.
.	.	.	.	6535	icaco coco plum	Chrysobalanus	icaco	CHIC	U	U	U	C, U	C	.	.	.
.	.	.	.	431	giant chinkapin, golden chinkapin	Chrysolepis	chrysophylla var. chrysophylla	CHCHC4	R, U	PNWS, U	U	U	.	.	.	P2
.	.	.	.	6539	bastard redwood	Chrysophyllum	argenteum	CHAR6	U	U	U	C, U	C	.	.	.
.	.	.	.	6541	star apple	Chrysophyllum	cainito	CHCA10	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6542	satinleaf	Chrysophyllum	oliviforme	CHOL	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6543	camito de perro	Chrysophyllum	pauciflorum	CHPA31	U	U	U	C, U	C	.	.	.
.	.	.	.	6546	Chamissos manfern	Cibotium	chamissoi	CICH	U	P, U	U	U	.	P	.	.

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.	.	.	.	6547	hapuu	Cibotium	glaucum	CIGL	U	P, U	U	U	.	P	.	.
.	.	.	.	6545	Hawaiian tree fern	Cibotium	heleniae	CIHE7	U	P, U	U	U	.	P	.	.
.	.	.	.	6548	hapuu li	Cibotium	menziesii	CIME8	U	P, U	U	U	.	P	.	.
.	.	.	.	6549	manfern	Cibotium	spp.	CIBOT	U	P, U	U	U	.	P	.	.
.	.	.	.	6552	quinine	Cinchona	pubescens	CIPU	U	P, U	U	U	.	P	.	.
.	.	.	.	6554	cassia	Cinnamomum	aromaticum	CIAR8	U	U	U	C, U	C	.	.	.
.	.	.	.	6555	Padang cassia	Cinnamomum	burmannii	CIBU2	U	P, U	U	U	.	P	.	.
.	.	.	.	858	camphortree	Cinnamomum	camphora	CICA	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	6557	ochod	Cinnamomum	carolinense	CICA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6559	laurel avispillo	Cinnamomum	elongatum	CIEL2	U	U	U	C, U	C	.	.	.
.	.	.	.	6560	avispillo	Cinnamomum	montanum	CIMO3	U	U	U	C, U	C	.	.	.
.	.	.	.	6561	ochod	Cinnamomum	pedatinervium	CIPE6	U	P, U	U	U	.	P	.	.
.	.	.	.	6562	matieu	Cinnamomum	sessilifolium	CISE2	U	P, U	U	U	.	P	.	.
.	.	.	.	6564	cinnamon	Cinnamomum	verum	CIVE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6565	juniper berry	Citharexylum	caudatum	CICA8	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6567	spiny fiddlewood	Citharexylum	spinosum	CISP3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6570	samoensis	Citronella	samoensis	CISA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6572	Lime (Tipolo)	Citrus	aurantifolia	CIAU	U	P, U	U	U	.	P	.	.
.	.	.	.	6579	limon china	Citrus	hystrix	CIHY2	U	P, U	U	U	.	P	.	.
.	.	.	.	6580	kahet, wild orange	Citrus	macroptera	CIMA10	U	P, U	U	U	.	P	.	.
.	.	.	.	6581	Citrus maxima	Citrus	maxima	CIMA5	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6582	Citrus medica	Citrus	medica	CIME3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6583	calamondin, kingkang	Citrus	mitis	CIMI3	U	P, U	U	U	.	P	.	.
.	.	.	.	6584	Citrus reticulata	Citrus	reticulata	CIRE3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	860	citrus spp.	Citrus	spp.	CITRU2	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	6573	key lime	Citrus	xaurantiifolia	CIAU7	U	U	U	C, U	C	.	.	.
.	.	.	.	6574	sour orange	Citrus	xaurantium	CIAU8	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6575	lemon	Citrus	xlimon	CILI5	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6576	grapefruit	Citrus	xparadisi	CIPA3	U	U	U	C, U	C	.	.	.
.	.	.	.	6577	sweet orange	Citrus	xsinensis	CISI3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	481	yellowwood	Cladrastis	kentukea	CLKE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6586	koee	Claoxylon	carolinianum	CLCA15	U	P, U	U	U	.	P	.	.
.	.	.	.	6588	Claoxylon fallax	Claoxylon	fallax	CLFA6	U	P, U	U	U	.	P	.	.
.	.	.	.	6589	Claoxylon longiracemosum	Claoxylon	longiracemosum	CLLO5	U	P, U	U	U	.	P	.	.
.	.	.	.	6590	katteknau, katot	Claoxylon	marianum	CLMA25	U	P, U	U	U	.	P	.	.
.	.	.	.	6591	poola	Claoxylon	sandwicense	CLSA	U	P, U	U	U	.	P	.	.
.	.	.	.	6593	Cleistanthus carolinianus	Cleistanthus	carolinianus	CLCA18	U	P, U	U	U	.	P	.	.
.	.	.	.	6594	Cleistanthus insularis	Cleistanthus	insularis	CLIN8	U	P, U	U	U	.	P	.	.

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.	.	.	.	6597	oha wai nui	Clermontia	arborescens	CLAR4	U	P, U	U	U	.	P	.	.
.	.	.	.	6601	Kauai clermontia	Clermontia	clermontioides	CLCL	U	P, U	U	U	.	P	.	.
.	.	.	.	6604	Kohala Mountain clermontia	Clermontia	drepanomorpha	CLDR2	U	P, U	U	U	.	P	.	.
.	.	.	.	6605	haha aiakamanu	Clermontia	fauriei	CLFA	U	P, U	U	U	.	P	.	.
.	.	.	.	6606	bog clermontia	Clermontia	grandiflora	CLGR3	U	P, U	U	U	.	P	.	.
.	.	.	.	6610	oha kepau	Clermontia	hawaiiensis	CLHA4	U	P, U	U	U	.	P	.	.
.	.	.	.	6611	forest clermontia	Clermontia	kakeana	CLKA	U	P, U	U	U	.	P	.	.
.	.	.	.	6612	Waipio Valley clermontia	Clermontia	kohalae	CLKO	U	P, U	U	U	.	P	.	.
.	.	.	.	6596	oha wai nui Clermontia	Clermontia	leptoclada	CLLE3	U	P, U	U	U	.	P	.	.
.	.	.	.	6613	hillside clermontia	Clermontia	lindseyana	CLLI3	U	P, U	U	U	.	P	.	.
.	.	.	.	6614	Maui clermontia	Clermontia	micrantha	CLMI3	U	P, U	U	U	.	P	.	.
.	.	.	.	6615	Mauna Loa clermontia	Clermontia	montis-loa	CLMO5	U	P, U	U	U	.	P	.	.
.	.	.	.	6616	Oahu clermontia	Clermontia	oblongifolia	CLOB2	U	P, U	U	U	.	P	.	.
.	.	.	.	6620	Wailai Pali clermontia	Clermontia	pallida	CLPA6	U	P, U	U	U	.	P	.	.
.	.	.	.	6621	smallflower clermontia	Clermontia	parviflora	CLPA8	U	P, U	U	U	.	P	.	.
.	.	.	.	6622	pele clermontia	Clermontia	peleana	CLPE2	U	P, U	U	U	.	P	.	.
.	.	.	.	6625	Waioiani clermontia	Clermontia	persicifolia	CLPE3	U	P, U	U	U	.	P	.	.
.	.	.	.	6626	Hamakua clermontia	Clermontia	pyrularia	CLPY2	U	P, U	U	U	.	P	.	.
.	.	.	.	6627	Clermontia singuliflora	Clermontia	singuliflora	CLSI3	U	P, U	U	U	.	P	.	.
.	.	.	.	6628	clermontia	Clermontia	spp.	CLERM	U	P, U	U	U	.	P	.	.
.	.	.	.	6629	Haleakala clermontia	Clermontia	tuberculata	CLTU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6630	swampforest clermontia	Clermontia	waimeae	CLWA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6631	haggarbush	Clerodendrum	aculeatum	CLAC2	U	U	U	C, U	C	.	.	.
.	.	.	.	5523	rose glorybower	Clerodendrum	bungei	CLBU	U	U	U	U	.	.	U	.
.	.	.	.	6633	Natal glorybower	Clerodendrum	glabrum	CLGL2	U	P, U	U	U	.	P	.	.
.	.	.	.	6635	velvetleaf glorybower	Clerodendrum	macrostegium	CLMA24	U	P, U	U	U	.	P	.	.
.	.	.	.	6636	glorybower	Clerodendrum	spp.	CLERO2	U	P, U	U	U	.	P	.	.
.	.	.	.	5529	mountain sweetpepperbush	Clethra	acuminata	CLAC3	U	U	U	U	.	.	U	.
.	.	.	.	6637	teta prieta	Cleyera	albopunctata	CLAL4	U	U	U	C, U	C	.	.	.
.	.	.	.	6639	jackass breadnut	Clibadium	erosum	CLER	U	U	U	C, U	C	.	.	.
.	.	.	.	6641	Clidemia cymosa	Clidemia	cymosa	CLCY5	U	U	U	C, U	C	.	.	.
.	.	.	.	6645	kiniyaw, ochop	Clinostigma	carolinense	CLCA21	U	P, U	U	U	.	P	.	.

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.	.	.	.	6644	Philippine pigeonwings	Clitoria	fairchildiana	CLFA5	U	U	U	C, U	C	.	.	.
.	.	.	.	6646	cupeillo	Clusia	clusioides	CLCL2	U	U	U	C, U	C	.	.	.
.	.	.	.	6648	Grundlach's attorney	Clusia	gundlachii	CLGU	U	U	U	C, U	C	.	.	.
.	.	.	.	6650	cupey de monte	Clusia	minor	CLMI2	U	U	U	C, U	C	.	.	.
.	.	.	.	6651	Scotch attorney	Clusia	rosea	CLRO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6655	treadsoftly	Cnidoscolus	aconitifolius	CNAC	U	U	U	C, U	C	.	.	.
.	.	.	.	6658	uvilla	Coccoloba	costata	COCO8	U	U	U	C, U	C	.	.	.
.	.	.	.	863	tietongue, pigeon-plum	Coccoloba	diversifolia	CODI8	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	6660	whitewood	Coccoloba	krugii	COKR	U	U	U	C, U	C	.	.	.
.	.	.	.	6661	puckhout	Coccoloba	microstachya	COMI	U	U	U	C, U	C	.	.	.
.	.	.	.	6662	pale seagrape	Coccoloba	pallida	COPA24	U	U	U	C, U	C	.	.	.
.	.	.	.	6663	grandleaf seagrape	Coccoloba	pubescens	COPU	U	U	U	C, U	C	.	.	.
.	.	.	.	6664	uvera	Coccoloba	pyrifolia	COPY	U	U	U	C, U	C	.	.	.
.	.	.	.	6665	ortegon	Coccoloba	rugosa	CORU4	U	U	U	C, U	C	.	.	.
.	.	.	.	6666	uvero de monte	Coccoloba	sintenisii	COSI2	U	U	U	C, U	C	.	.	.
.	.	.	.	6668	Swartz's pigeonplum	Coccoloba	swartzii	COSW	U	U	U	C, U	C	.	.	.
.	.	.	.	6669	Bahama pigeonplum	Coccoloba	tenuifolia	COTE9	U	U	U	C, U	C	.	.	.
.	.	.	.	6670	seagrape	Coccoloba	uvifera	COUV	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6671	false chiggergrape	Coccoloba	venosa	COVE	U	U	U	C, U	C	.	.	.
.	.	.	.	907	Florida silver palm	Coccothrinax	argentata	COAR	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	6673	Coccothrinax barbadensis	Coccothrinax	barbadensis	COBA3	U	U	U	C, U	C	.	.	.
.	.	.	.	6679	silk cottontree	Cochlospermum	vitifolium	COVI	U	U	U	C, U	C	.	.	.
.	.	.	.	908	coconut palm	Cocos	nucifera	CONU	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	6683	garden croton	Codiaeum	variegatum	COVA3	U	U	U	C, U	C	.	.	.
.	.	.	.	6684	Arabian coffee	Coffea	arabica	COAR2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6686	Coffea liberica	Coffea	liberica	COLI8	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6685	robusta coffee	Coffea	robusta	CORO8	U	P, U	U	U	.	P	.	.
.	.	.	.	6688	Cojoba arborea	Cojoba	arborea	COAR9	U	U	U	C, U	C	.	.	.
.	.	.	.	6689	abata cola	Cola	acuminata	COAC4	U	U	U	C, U	C	.	.	.
.	.	.	.	6691	uab, chuchab	Colona	scabra	COSC13	U	P, U	U	U	.	P	.	.
.	.	.	.	6693	common snakebark	Colubrina	arborescens	COAR3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	864	soldierwood	Colubrina	elliptica	COEL2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	6697	kauila	Colubrina	oppositifolia	COOP	U	P, U	U	U	.	P	.	.
.	.	.	.	5559	bladder senna	Colutea	arborescens	COAR6	U	U	U	U	.	.	U	.
.	.	.	.	6703	Mao	Commersonia	bartramia	COBA17	U	P, U	U	U	.	P	.	.
.	.	.	.	6705	poison ash	Comocladia	dodonaea	CODO	U	U	U	C, U	C	.	.	.

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.	.	.	.	6706	carrasco	Comocladia	glabra	COGL4	U	U	U	C, U	C	.	.	.
.	.	.	w	867	Bluewood	Condalia	hookeri	COHO	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	987	buttonwood-mangrove	Conocarpus	erectus	COER2	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	6710	Luquillo Mountain snailwood	Conostegia	rufescens	CORU17	U	U	U	C, U	C	.	.	.
.	.	.	.	6711	Consolea moniliformis	Consolea	moniliformis	COMO8	U	U	U	C, U	C	.	.	.
.	.	.	.	6712	Consolea rubescens	Consolea	rubescens	CORU8	U	U	U	C, U	C	.	.	.
.	.	.	.	6714	copaiba	Copaifera	officinalis	COOF2	U	U	U	C, U	C	.	.	.
.	.	.	.	6716	forest mirrorplant	Coprosma	foliosa	COFO2	U	P, U	U	U	.	P	.	.
.	.	.	.	6717	koi	Coprosma	kauensis	COKA	U	P, U	U	U	.	P	.	.
.	.	.	.	6718	Oahu mirrorplant	Coprosma	longifolia	COLO4	U	P, U	U	U	.	P	.	.
.	.	.	.	6719	alpine mirrorplant	Coprosma	montana	COMO3	U	P, U	U	U	.	P	.	.
.	.	.	.	6720	Maui mirrorplant	Coprosma	ochracea	COOC3	U	P, U	U	U	.	P	.	.
.	.	.	.	6721	pubescent mirrorplant	Coprosma	pubens	COPU8	U	P, U	U	U	.	P	.	.
.	.	.	.	6722	woodland mirrorplant	Coprosma	rhynchocarpa	CORH	U	P, U	U	U	.	P	.	.
.	.	.	.	6724	mirrorplant	Coprosma	spp.	COPRO	U	P, U	U	U	.	P	.	.
.	.	.	.	6726	olena	Coprosma	waimeae	COWA4	U	P, U	U	U	.	P	.	.
.	.	.	.	6728	Spanish elm	Cordia	alliodora	COAL	U	U	U	C, U	C	.	.	.
.	.	.	.	6729	Tou	Cordia	aspera	COAS6	U	P, U	U	U	.	P	.	.
.	.	.	.	8651	Anacahuita Texas Olive	Cordia	boissieri	COBO2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	6730	muneco	Cordia	borinquensis	COBO3	U	U	U	C, U	C	.	.	.
.	.	.	.	6731	red manjack	Cordia	collococca	COCO5	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6733	fragrant manjack	Cordia	dichotoma	CODI18	U	P, U	U	U	.	P	.	.
.	.	.	.	6735	smooth manjack	Cordia	laevigata	COLA12	U	U	U	C, U	C	.	.	.
.	.	.	.	6736	Cordia micronesica	Cordia	micronesica	COMI6	U	P, U	U	U	.	P	.	.
.	.	.	.	6737	clammy cherry	Cordia	obliqua	COOB3	U	U	U	C, U	C	.	.	.
.	.	.	.	6738	San Bartolome	Cordia	rickseckeri	CORI	U	U	U	C, U	C	.	.	.
.	.	.	.	865	largeleaf geigertree	Cordia	sebestena	COSE2	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	6742	kou	Cordia	subcordata	COSU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6743	mucilage manjack	Cordia	sulcata	COSU3	U	U	U	C, U	C	.	.	.
.	.	.	.	6744	tiplant	Cordyline	fruticosa	COFR2	U	P, U	U	U	.	P	.	.
.	.	.	.	6745	cordyline	Cordyline	spp.	CORDY 2	U	P, U	U	U	.	P	.	.
.	.	.	.	6748	roughleaf dogwood	Cornus	drummondii	CODR	U	U	U	U	.	.	U	.
.	.	.	.	491	flowering dogwood	Cornus	florida	COFL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5591	kousa dogwood	Cornus	kousa	COKO2	U	U	U	U	.	.	U	.
.	.	.	.	492	Pacific dogwood	Cornus	nuttallii	CONU4	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	6746	nigua	Cornutia	obovata	COOB4	U	U	U	C, U	C	.	.	.

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.	.	.	.	6747	azulejo	Cornutia	pyramidata	COPY2	U	U	U	C, U	C	.	.	.
.	.	.	.	5600	Turkish hazelnut	Corylus	colurna	COCO30	U	U	U	U	.	.	U	.
.	.	.	.	6749	redgum	Corymbia	calophylla	COCA48	U	P, U	U	U	.	P	.	.
.	.	.	.	6750	Corymbia citriodora	Corymbia	citriodora	COCI4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6751	redflower gum	Corymbia	ficifolia	COFI7	U	P, U	U	U	.	P	.	.
.	.	.	.	6752	red bloodwood	Corymbia	gummifera	COGU4	U	P, U	U	U	.	P	.	.
.	.	.	.	6754	karaka nut	Corynocarpus	laevigatus	COLA6	U	P, U	U	U	.	P	.	.
.	.	.	.	5603	European smoketree	Cotinus	coggygria	COCO10	U	U	U	U	.	.	U	.
.	.	.	.	996	smoketree	Cotinus	obovatus	COOB2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6756	cannonball tree	Couroupita	guianensis	COGU3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	503	Brainerd's hawthorn	Crataegus	brainerdii	CRBR3	.	U	U	U	.	.	.	P2
.	.	.	.	504	pear hawthorn	Crataegus	calpodendron	CRCA	.	U	U	U	.	.	.	P2
.	.	.	.	505	fireberry hawthorn	Crataegus	chrysocarpa	CRCH	.	U	U	U	.	.	.	P2
.	.	.	.	501	cockspur hawthorn	Crataegus	crus-galli	CRCR2	.	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	506	broadleaf hawthorn	Crataegus	dilatata	CRDI	.	U	U	U	.	.	.	P2
.	.	.	.	507	fanleaf hawthorn	Crataegus	flabellata	CRFL	.	U	U	U	.	.	.	P2
.	.	.	.	502	downy hawthorn	Crataegus	mollis	CRMO2	.	PNWS, U	U	R, U	.	.	.	P2
NUE	.	.	.	508	oneseed hawthorn	Crataegus	monogyna	CRMO3	.	U	U	U	.	.	.	P2
.	.	.	.	509	scarlet hawthorn	Crataegus	pedicellata	CRPE	.	U	U	U	.	.	.	P2
.	5, 6, 10	.	.	500	hawthorn spp.	Crataegus	spp.	CRATA	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	5092	fleshy hawthorn	Crataegus	succulenta	CRSU5	.	U	U	U	.	.	.	P2
.	.	.	.	5093	dwarf hawthorn	Crataegus	uniflora	CRUN	.	U	U	U	.	.	.	P2
.	.	.	.	6758	sacred garlic pear	Crateva	religiosa	CRRE12	U	P, U	U	U	.	P	.	.
.	.	.	.	6760	houka, calabash	Crescentia	alata	CRAL11	U	P, U	U	U	.	P	.	.
.	.	.	.	6761	common calabash tree	Crescentia	cujete	CRCU	U	U	U	C, U	C	.	.	.
.	.	.	.	6762	higuerito	Crescentia	linearifolia	CRLI5	U	U	U	C, U	C	.	.	.
.	.	.	.	6763	higuero de sierra	Crescentia	portoricensis	CRPO6	U	U	U	C, U	C	.	.	.
.	.	.	.	6765	Critonia portoricensis	Critonia	portoricensis	CRPO7	U	U	U	C, U	C	.	.	.
.	.	.	.	6767	maidenberry	Crossopetalum	rhacoma	CRRH	U	U	U	C, U	C	.	.	.
.	.	.	.	6769	Saitamu	Crossostylis	biflora	CRBI9	U	P, U	U	U	.	P	.	.
.	.	.	.	6771	longbeak rattlebox	Crotalaria	longirostrata	CRLO3	U	P, U	U	U	.	P	.	.
.	.	.	.	6773	wild marrow	Croton	astroites	CRAS3	U	U	U	C, U	C	.	.	.
.	.	.	.	6774	Croton flavens	Croton	flavens	CRFL23	U	U	U	C, U	C	.	.	.
.	.	.	.	6775	sabinon	Croton	poecilanthus	CRPO4	U	U	U	C, U	C	.	.	.
.	.	.	.	6779	laulilii	Cryptocarya	elegans	CREL8	U	P, U	U	U	.	P	.	.
.	.	.	.	6781	holio	Cryptocarya	mannii	CRMA8	U	P, U	U	U	.	P	.	.
.	.	.	.	6778	Cryptocarya oreophila	Cryptocarya	oreophila	CROR5	U	P, U	U	U	.	P	.	.
.	.	.	.	6784	laulilii	Cryptocarya	turbinata	CRTU4	U	P, U	U	U	.	P	.	.
.	.	.	.	5776	storehousebush	Cudrania	tricuspidata	CUTR2	U	U	U	U	.	.	U	.

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.	.	.	.	6790	wild ackee	Cupania	americana	CUAM	U	U	U	C, U	C	.	.	.
.	.	.	.	6792	guara blanca	Cupania	triquetra	CUTR	U	U	U	C, U	C	.	.	.
.	.	.	.	866	carrotwood	Cupaniopsis	anacardioides	CUAN4	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	6800	Haleakala cyanea	Cyanea	aculeatiflora	CYAC4	U	P, U	U	U	.	P	.	.
.	.	.	.	6801	palmtree cyanea	Cyanea	arborea	CYAR10	U	P, U	U	U	.	P	.	.
.	.	.	.	6802	Kauai cyanea	Cyanea	fissa	CYFI6	U	P, U	U	U	.	P	.	.
.	.	.	.	6805	Degeners cyanea	Cyanea	floribunda	CYFL4	U	P, U	U	U	.	P	.	.
.	.	.	.	6806	Kilauea Mauna cyanea	Cyanea	giffardii	CYGI5	U	P, U	U	U	.	P	.	.
.	.	.	.	6807	wetforest cyanea	Cyanea	hamatiflora	CYHA6	U	P, U	U	U	.	P	.	.
.	.	.	.	6810	Oahu cyanea	Cyanea	hardyi	CYHA7	U	P, U	U	U	.	P	.	.
.	.	.	.	6811	prickly cyanea	Cyanea	horrida	CYHO6	U	P, U	U	U	.	P	.	.
.	.	.	.	6812	Limahuli Valley cyanea	Cyanea	kuhihewa	CYKU3	U	P, U	U	U	.	P	.	.
.	.	.	.	6813	Kunths cyanea	Cyanea	kunthiana	CYKU	U	P, U	U	U	.	P	.	.
.	.	.	.	6814	giant kokee cyanea	Cyanea	leptostegia	CYLE5	U	P, U	U	U	.	P	.	.
.	.	.	.	6815	purple cyanea	Cyanea	macrostegia	CYMA10	U	P, U	U	U	.	P	.	.
.	.	.	.	6818	Marks cyanea	Cyanea	marksii	CYMA14	U	P, U	U	U	.	P	.	.
.	.	.	.	6819	hairy cyanea	Cyanea	pilosa	CYPI4	U	P, U	U	U	.	P	.	.
.	.	.	.	6822	pohaku cyanea	Cyanea	pohaku	CYPO5	U	P, U	U	U	.	P	.	.
.	.	.	.	6823	Molokai cyanea	Cyanea	procera	CYPR8	U	P, U	U	U	.	P	.	.
.	.	.	.	6824	manyfruit cyanea	Cyanea	pycnocarpa	CYPY	U	P, U	U	U	.	P	.	.
.	.	.	.	6825	oakleaf cyanea	Cyanea	quercifolia	CYQU	U	P, U	U	U	.	P	.	.
.	.	.	.	6826	plateau delissea	Cyanea	rivularis	CYRI4	U	P, U	U	U	.	P	.	.
.	.	.	.	6827	pua kala	Cyanea	solenocalyx	CYSO2	U	P, U	U	U	.	P	.	.
.	.	.	.	6828	cyanea	Cyanea	spp.	CYANE	U	P, U	U	U	.	P	.	.
.	.	.	.	6829	Kaiholena cyanea	Cyanea	stictophylla	CYST5	U	P, U	U	U	.	P	.	.
.	.	.	.	6830	Mt. Kaala cyanea	Cyanea	superba	CYSU8	U	P, U	U	U	.	P	.	.
.	.	.	.	6833	aku aku	Cyanea	tritomantha	CYTR6	U	P, U	U	U	.	P	.	.
.	.	.	.	6834	parrotfeather treefern	Cyathea	andina	CYAN	U	U	U	C, U	C	.	.	.
.	.	.	.	6835	West Indian treefern	Cyathea	arborea	CYAR	U	U	U	C, U	C	.	.	.
.	.	.	.	6837	Coopers cyathea	Cyathea	cooperi	CYCO18	U	P, U	U	U	.	P	.	.
.	.	.	.	6838	olioli	Cyathea	decurrens	CYDE16	U	P, U	U	U	.	P	.	.
.	.	.	.	6839	Jamaican treefern	Cyathea	furfuracea	CYFU	U	U	U	C, U	C	.	.	.
.	.	.	.	6840	olioli	Cyathea	lunulata	CYLU5	U	P, U	U	U	.	P	.	.
.	.	.	.	6841	olioli	Cyathea	medullaris	CYME12	U	P, U	U	U	.	P	.	.
.	.	.	.	6842	kattar	Cyathea	nigricans	CYNI7	U	P, U	U	U	.	P	.	.
.	.	.	.	6843	small treefern	Cyathea	parvula	CYPA7	U	U	U	C, U	C	.	.	.
.	.	.	.	6844	kattar	Cyathea	ponapeana	CYPO11	U	P, U	U	U	.	P	.	.
.	.	.	.	6848	helecho gigante	Cyathea	tenera	CYTE10	U	U	U	C, U	C	.	.	.
.	.	.	.	6849	olioli	Cyathea	truncata	CYTR11	U	P, U	U	U	.	P	.	.

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.	.	.	.	6850	Cybianthus sintenisii	Cybianthus	sintenisii	CYSI	U	U	U	C, U	C	.	.	.
.	.	.	.	6852	queen sago	Cycas	circinalis	CYCI3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6853	remiang	Cycas	revoluta	CYRE11	U	P, U	U	U	.	P	.	.
.	.	.	.	6855	ola	Cyclophyllum	barbatum	CYBA7	U	P, U	U	U	.	P	.	.
.	.	.	.	5818	quince	Cydonia	oblonga	CYOB2	U	U	U	U	.	.	U	.
.	.	.	.	6857	oreganillo falso	Cynometra	portoricensis	CYPO2	U	U	U	C, U	C	.	.	.
.	.	.	.	6858	gulos	Cynometra	ramiflora	CYRA8	U	P, U	U	U	.	P	.	.
.	.	.	.	6859	eeme, aapwo	Cynometra	yokotae	CYYO	U	P, U	U	U	.	P	.	.
.	.	.	.	6860	tree-tomato	Cyphomandra	betacea	CYBE3	U	P, U	U	U	.	P	.	.
.	.	MLE	.	6862	swamp titi	Cyrilla	racemiflora	CYRA	U	U	U	C, U	C	.	.	.
.	.	.	.	6865	forest cyrtandra	Cyrtandra	giffardii	CYGI3	U	P, U	U	U	.	P	.	.
.	.	.	.	6864	Cyrtandra	Cyrtandra	ramosissima	CYRA3	U	P, U	U	U	.	P	.	.
.	.	.	.	6867	candletree	Dacryodes	excelsa	DAEX	U	U	U	C, U	C	.	.	.
.	.	.	.	6868	cocobolo	Dalbergia	retusa	DARE6	U	P, U	U	U	.	P	.	.
.	.	.	.	6869	Indian rosewood	Dalbergia	sissoo	DASI	U	U	U	C, U	C	.	.	.
.	.	.	.	6870	cocobolo	Dalbergia	tucurensis	DATU	U	P, U	U	U	.	P	.	.
.	.	.	.	6871	burn nose	Daphnopsis	americana	DAAM2	U	U	U	C, U	C	.	.	.
.	.	.	.	6872	Heller's cieneguillo	Daphnopsis	helleriana	DAHE2	U	U	U	C, U	C	.	.	.
.	.	.	.	6873	emajagua de sierra	Daphnopsis	philippiana	DAPH	U	U	U	C, U	C	.	.	.
.	.	.	.	6875	Hawaii delissea	Delissea	fallax	DEFA	U	P, U	U	U	.	P	.	.
.	.	.	.	6876	cutleaf delissea	Delissea	laciniata	DELA4	U	P, U	U	U	.	P	.	.
.	.	.	.	6877	Niihau delissea	Delissea	niihauensis	DENI	U	P, U	U	U	.	P	.	.
.	.	.	.	6880	smallflower delissea	Delissea	parviflora	DEPA9	U	P, U	U	U	.	P	.	.
.	.	.	.	6881	delissea	Delissea	spp.	DELIS	U	P, U	U	U	.	P	.	.
.	.	.	.	6882	leechleaf delissea	Delissea	undulata	DEUN2	U	P, U	U	U	.	P	.	.
.	.	.	.	6883	royal poinciana	Delonix	regia	DERE	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6885	salato	Dendrocnide	harveyi	DEHA5	U	P, U	U	U	.	P	.	.
.	.	.	.	6886	kahtat	Dendrocnide	latifolia	DELA13	U	P, U	U	U	.	P	.	.
.	.	.	.	6888	angelica tree	Dendropanax	arboreus	DEAR	U	U	U	C, U	C	.	.	.
.	.	.	.	6889	palo de vaca	Dendropanax	laurifolius	DELA3	U	U	U	C, U	C	.	.	.
.	.	.	.	6891	redpalm	Dictyosperma	album	DIAL13	U	P, U	U	U	.	P	.	.
.	.	.	.	6896	chulta	Dillenia	indica	DIIN6	U	U	U	C, U	C	.	.	.
.	.	.	.	6898	shrubby dillenia	Dillenia	suffruticosa	DISU11	U	P, U	U	U	.	P	.	.
.	.	.	.	6899	Dimocarpus longan	Dimocarpus	longan	DILO7	U	U	U	C, U	C	.	.	.
.	.	.	.	6900	mabolo	Diospyros	blancoi	DIBL3	U	P, U	U	U	.	P	.	.
.	.	.	.	6902	Mabolo	Diospyros	discolor	DIDI9	U	P, U	U	U	.	P	.	.
.	.	.	.	6904	anume	Diospyros	elliptica	DIEL3	U	P, U	U	U	.	P	.	.
.	.	.	.	6905	Diospyros ferrea	Diospyros	ferrea	DIFE5	U	P, U	U	U	.	P	.	.
.	.	.	.	6906	elama	Diospyros	hillebrandii	DIHI4	U	P, U	U	U	.	P	.	.
.	.	.	.	6907	persimmon	Diospyros	kaki	DIKA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6909	black apple	Diospyros	revoluta	DIRE6	U	U	U	C, U	C	.	.	.

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.	.	.	.	6910	auauli	Diospyros	samoensis	DISA16	U	P, U	U	U	.	P	.	.
.	.	.	.	6911	lama	Diospyros	sandwicensis	DISA10	U	P, U	U	U	.	P	.	.
.	.	.	.	6912	Chinese persimmon	Diospyros	sintenisii	DISI3	U	U	U	C, U	C	.	.	.
.	.	.	w	522	Texas persimmon	Diospyros	texana	DITE3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	521	common persimmon	Diospyros	virginiana	DIVI5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6921	otot	Discocalyx	ponapensis	DIPO	U	P, U	U	U	.	P	.	.
.	.	.	.	6923	jaboncillo	Ditta	myricoides	DIMY	U	U	U	C, U	C	.	.	.
.	.	.	.	6927	Florida hopbush	Dodonaea	viscosa	DOVI	U	U	U	C, U	C	.	.	.
.	.	.	.	6928	rru	Dolichandrone	spathacea	DOSP3	U	P, U	U	U	.	P	.	.
.	.	.	.	6930	Ceylon gooseberry	Dovyalis	hebecarpa	DOHE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6932	fragrant dracaena	Dracaena	fragrans	DRFR2	U	U	U	C, U	C	.	.	.
.	.	.	.	6933	Dracaena multiflora	Dracaena	multiflora	DRMU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6934	song of India	Dracaena	reflexa	DRRE6	U	P, U	U	U	.	P	.	.
.	.	.	.	6937	cafeillo	Drypetes	alba	DRAL5	U	U	U	C, U	C	.	.	.
.	.	.	.	6935	Drypetes carolinensis	Drypetes	carolinensis	DRCA18	U	P, U	U	U	.	P	.	.
.	.	.	.	6936	Drypetes dolichocarpa	Drypetes	dolichocarpa	DRDO3	U	P, U	U	U	.	P	.	.
.	.	.	.	6938	varital	Drypetes	glauca	DRGL2	U	U	U	C, U	C	.	.	.
.	.	.	.	6939	rosewood	Drypetes	ilicifolia	DRIL	U	U	U	C, U	C	.	.	.
.	.	.	.	6940	guiana plum	Drypetes	lateriflora	DRLA3	U	U	U	C, U	C	.	.	.
.	.	.	.	6941	kevert	Drypetes	nitida	DRNI3	U	P, U	U	U	.	P	.	.
.	.	.	.	6943	.	Drypetes	vitiensis	DRVI5	U	P, U	U	U	.	P	.	.
.	.	.	.	6949	Drypetes yapensis	Drypetes	yapensis	DRYA	U	P, U	U	U	.	P	.	.
.	.	.	.	6947	Mauna Kea dubautia	Dubautia	arborea	DUAR	U	P, U	U	U	.	P	.	.
.	.	.	.	6944	Dubautia	Dubautia	demissifolia	DUDE	U	P, U	U	U	.	P	.	.
.	.	.	.	6945	Dubautia	Dubautia	fallax	DUFA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6948	forest dubautia	Dubautia	knudsenii	DUKN	U	P, U	U	U	.	P	.	.
.	.	.	.	6952	Kauai dubautia	Dubautia	microcephala	DUMI	U	P, U	U	U	.	P	.	.
.	.	.	.	6946	Dubautia	Dubautia	montana	DUMO2	U	P, U	U	U	.	P	.	.
.	.	.	.	6953	plantainleaf dubautia	Dubautia	plantaginea	DUPL	U	P, U	U	U	.	P	.	.
.	.	.	.	6957	netvein dubautia	Dubautia	reticulata	DURE2	U	P, U	U	U	.	P	.	.
.	.	.	.	6958	dubautia	Dubautia	spp.	DUBAU	U	P, U	U	U	.	P	.	.
.	3	.	.	6961	golden dewdrops	Duranta	erecta	DUER	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6965	Durian	Durio	zibethinus	DUZI	U	P, U	U	U	.	P	.	.
.	.	.	w	6966	areca palm	Dypsis	lutescens	DYLU	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6968	maota mea	Dysoxylum	huntii	DYHU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6969	maota	Dysoxylum	maota	DYMA	U	P, U	U	U	.	P	.	.
.	.	.	.	6972	Dysoxylum mollissimum ssp. Molle	Dysoxylum	mollissimum	DYMOM	U	P, U	U	U	.	P	.	.

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.	.	.	.	6970	mamala	Dysoxylum	samoense	DYSA	U	P, U	U	U	.	P	.	.
.	.	.	.	868	Blackbead ebony	Ebenopsis	ebano	EBEB	R, U	U	U	R, U	.	.	.	P2
.	.	.	w	523	Anacua knockaway	Ehretia	anacua	EHAN	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	997	Russian-olive	Elaeagnus	angustifolia	ELAN	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6973	oil nut palm	Elaeis	guineensis	ELGU	U	P, U	U	U	.	P	.	.
.	.	.	.	6975	kalia	Elaeocarpus	bifidus	ELBI	U	P, U	U	U	.	P	.	.
.	.	.	.	6976	syatak	Elaeocarpus	carolinensis	ELCA20	U	P, U	U	U	.	P	.	.
.	.	.	.	6977	`a`mati`e	Elaeocarpus	floridanus	ELFL6	U	P, U	U	U	.	P	.	.
.	.	.	.	6978	Elaeocarpus graeffei	Elaeocarpus	graeffei	ELGR	U	P, U	U	U	.	P	.	.
.	.	.	.	6979	sapatua	Elaeocarpus	grandis	ELGR6	U	P, U	U	U	.	P	.	.
.	.	.	.	6980	joga	Elaeocarpus	joga	ELJO	U	P, U	U	U	.	P	.	.
.	.	.	.	6981	Elaeocarpus kerstingianus	Elaeocarpus	kerstingianus	ELKE	U	P, U	U	U	.	P	.	.
.	.	.	.	6974	Kosrae elaeocarpus	Elaeocarpus	kusaiensis	ELKU2	U	P, U	U	U	.	P	.	.
.	.	.	.	6982	maratte, opop	Elaeocarpus	kusanoi	ELKU	U	P, U	U	U	.	P	.	.
.	.	.	.	6984	aamatie	Elaeocarpus	tonganus	ELTO4	U	P, U	U	U	.	P	.	.
.	.	.	.	6985	Elaeocarpus	Elaeocarpus	ulianus	ELUL	U	P, U	U	U	.	P	.	.
.	.	.	.	6990	taputoi	Elattostachys	falcata	ELFA3	U	P, U	U	U	.	P	.	.
.	.	.	.	6994	elaeocarpa	Endiandra	elaeocarpa	ENEL	U	P, U	U	U	.	P	.	.
.	.	.	.	6996	monkeysoap	Enterolobium	cyclocarpum	ENCY	U	P, U	U	C, U	C	P	.	.
.	.	.	.	6997	bronze loquat	Eriobotrya	deflexa	ERDE16	U	U	U	U	.	.	U	.
.	.	.	.	6998	loquat	Eriobotrya	japonica	ERJA3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7000	blacktorch	Erithalis	fruticosa	ERFR4	U	U	U	C, U	C	.	.	.
.	.	.	.	7004	machete	Erythrina	berteriana	ERBE3	U	U	U	C, U	C	.	.	.
.	.	.	.	7005	coral erythrina	Erythrina	corallodendron	ERCO22	U	U	U	C, U	C	.	.	.
.	.	.	.	7003	naked coral tree	Erythrina	coralloides	ERCO	U	U	U	U	.	.	U	.
.	.	.	.	7006	crybabytree	Erythrina	crista-galli	ERCR6	U	U	U	C, U	C	.	.	.
.	.	.	.	7007	cock's spur	Erythrina	eggersii	EREG	U	U	U	C, U	C	.	.	.
.	.	.	.	7008	bucayo	Erythrina	fusca	ERFU2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7011	mountain immortelle	Erythrina	poeppigiana	ERPO5	U	U	U	C, U	C	.	.	.
.	.	.	.	7012	wili wili	Erythrina	sandwicensis	ERSA11	U	P, U	U	U	.	P	.	.
.	.	.	.	7014	gatae palagi	Erythrina	subumbrans	ERSU15	U	P, U	U	U	.	P	.	.
.	.	.	.	7015	tiger's claw	Erythrina	variegata	ERVA7	U	U	U	C, U	C	.	.	.
.	.	.	.	7016	tiger's claw	Erythrina	variegata var. orientalis	ERVAO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7017	acuminatissimum	Erythrospermum	acuminatissimum	ERAC10	U	P, U	U	U	.	P	.	.
.	.	.	.	7019	swamp-redwood	Erythroxylum	areolatum	ERAR17	U	U	U	C, U	C	.	.	.
.	.	.	.	7021	ratwood	Erythroxylum	rotundifolium	ERRO3	U	U	U	C, U	C	.	.	.
.	.	.	.	7022	rufous false cocaine	Erythroxylum	rufum	ERRU4	U	U	U	C, U	C	.	.	.
.	.	.	.	7024	Urban's false cocaine	Erythroxylum	urbanii	ERUR4	U	U	U	C, U	C	.	.	.

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.	.	.	.	7025	southern mahogany	Eucalyptus	botryoides	EUBO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7026	applebox	Eucalyptus	bridgesiana	EUBR2	U	P, U	U	U	.	P	.	.
.	.	.	.	512	river redgum	Eucalyptus	camaldulensis	EUCA2	R, U	PNWS, P, U	R, U	U	.	P	.	P2
.	.	.	.	7028	argyle apple	Eucalyptus	cinerea	EUCI80	U	P, U	U	U	.	P	.	.
.	.	.	.	7030	sugargum	Eucalyptus	cladocalyx	EUCL	U	P, U	U	U	.	P	U	.
.	.	.	.	7035	silver-dollar eucalyptus	Eucalyptus	cordata	EUCO31	U	U	U	U	.	.	U	.
.	.	.	.	7031	yate	Eucalyptus	cornuta	EUCO3	U	P, U	U	U	.	P	.	.
.	.	.	.	7032	narrowleaf red ironbark	Eucalyptus	crebra	EUCR	U	P, U	U	U	.	P	.	.
.	.	.	.	7033	roundleaf gum	Eucalyptus	deanei	EUDE	U	P, U	U	U	.	P	.	.
.	.	.	.	7034	Indonesian gum	Eucalyptus	deglupta	EUDE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	511	Tasmanian bluegum	Eucalyptus	globulus	EUGL	R, U	PNWS, P, U	R, U	U	.	P	.	P2
.	.	.	.	7038	tuart	Eucalyptus	gomphocephala	EUGO	U	P, U	U	U	.	P	.	.
.	.	.	.	7039	mountain graygum	Eucalyptus	goniocalyx	EUGO2	U	P, U	U	U	.	P	.	.
.	.	.	.	513	grand eucalyptus	Eucalyptus	grandis	EUGR12	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	7041	white box	Eucalyptus	hemiphloia	EUHE12	U	P, U	U	U	.	P	.	.
.	.	.	.	7036	white ironbark	Eucalyptus	leucoxylon	EULE13	U	U	U	U	.	.	U	.
.	.	.	.	7043	spotted gum	Eucalyptus	maculata	EUMA23	U	U	U	C, U	C	.	.	.
.	.	.	.	7044	jarrah	Eucalyptus	marginata	EUMA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7045	Australian tallowwood	Eucalyptus	microcorys	EUMI	U	P, U	U	U	.	P	.	.
.	.	.	.	7046	gray ironbark	Eucalyptus	paniculata	EUPA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7047	blackbutt	Eucalyptus	pilularis	EUPI	U	P, U	U	U	.	P	.	.
.	.	.	.	7040	redbox	Eucalyptus	polyanthemos	EUPO	U	U	U	U	.	.	U	.
.	.	.	.	7048	black ironbox	Eucalyptus	raveretiana	EURA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7049	redmahogany	Eucalyptus	resinifera	EURE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	514	swampmahogany	Eucalyptus	robusta	EURO2	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	7051	Western Australian floodedgum	Eucalyptus	rudis	EURU2	U	P, U	U	U	.	P	U	.
.	.	.	.	7052	black peppermint	Eucalyptus	salicifolia	EUSA17	U	P, U	U	U	.	P	.	.
.	.	.	.	7053	Sydney bluegum	Eucalyptus	saligna	EUSA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7054	red ironbark	Eucalyptus	sideroxylon	EUSI2	U	P, U	U	U	.	P	U	.
.	.	.	.	510	eucalyptus spp.	Eucalyptus	spp.	EUCAL	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	7056	forest redgum	Eucalyptus	tereticornis	EUTE	U	P, U	U	U	.	P	.	.
.	.	.	.	7057	manna gum	Eucalyptus	viminalis	EUVI	U	P, U	U	U	.	P	.	.
.	.	.	.	7060	white stopper	Eugenia	axillaris	EUAX	U	U	U	C, U	C	.	.	.
.	.	.	.	7061	blackrodwood	Eugenia	biflora	EUBI	U	U	U	C, U	C	.	.	.
.	.	.	.	7062	Sierra de Cayey stopper	Eugenia	boqueronensis	EUBO3	U	U	U	C, U	C	.	.	.

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.	.	.	.	7063	guayabota de sierra	Eugenia	borinquensis	EUBO4	U	U	U	C, U	C	.	.	.
.	.	.	.	7065	cloves	Eugenia	caryophyllus	EUCA16	U	P, U	U	U	.	P	.	.
.	.	.	.	7066	redberry stopper	Eugenia	confusa	EUCO4	U	U	U	C, U	C	.	.	.
.	.	.	.	7067	lathberry	Eugenia	cordata	EUCO5	U	U	U	C, U	C	.	.	.
.	.	.	.	7068	lathberry	Eugenia	cordata var. sintenisii	EUCOS	U	U	U	C, U	C	.	.	.
.	.	.	.	7069	sperry guava	Eugenia	corozalensis	EUCO13	U	U	U	C, U	C	.	.	.
.	.	.	.	7071	serrette guave	Eugenia	domingensis	EUDO	U	U	U	C, U	C	.	.	.
.	.	.	.	7072	guasabara	Eugenia	eggersii	EUEG	U	U	U	C, U	C	.	.	.
.	.	.	.	7075	smooth rodwood	Eugenia	glabrata	EUGL6	U	U	U	C, U	C	.	.	.
.	.	.	.	7076	Luquillo Mountain stopper	Eugenia	haematocarpa	EUHA4	U	U	U	C, U	C	.	.	.
.	.	.	.	7079	nioi	Eugenia	koolauensis	EUKO	U	P, U	U	U	.	P	.	.
.	.	.	.	7081	privet stopper	Eugenia	ligustrina	EULI	U	U	U	C, U	C	.	.	.
.	.	.	.	7084	birdcherry	Eugenia	monticola	EUMO	U	U	U	C, U	C	.	.	.
.	.	.	.	7086	Eugenia nitida	Eugenia	nitida	EUNI2	U	P, U	U	U	.	P	.	.
.	.	.	.	7087	orenged	Eugenia	palauensis	EUPA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7088	agatelang	Eugenia	palumbis	EUPA28	U	P, U	U	U	.	P	.	.
.	.	.	.	7089	rockmyrtle	Eugenia	procera	EUPR4	U	U	U	C, U	C	.	.	.
.	.	.	.	7090	Christmas cherry	Eugenia	pseudopsidium	EUPS	U	U	U	C, U	C	.	.	.
.	.	.	.	7091	mountain stopper	Eugenia	reinwardtiana	EURE7	U	P, U	U	U	.	P	.	.
.	.	.	.	873	red stopper	Eugenia	rhombea	EURH	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7093	serrasuela	Eugenia	serrasuela	EUSE9	U	U	U	C, U	C	.	.	.
.	.	.	.	7094	sessileleaf stopper	Eugenia	sessiliflora	EUSE10	U	U	U	C, U	C	.	.	.
.	.	.	.	7096	stopper	Eugenia	spp.	EUGEN	U	P, U	U	U	.	P	.	.
.	.	.	.	7098	Stahl's stopper	Eugenia	stahlii	EUST3	U	U	U	C, U	C	.	.	.
.	.	.	.	7100	Stewardson's stopper	Eugenia	stewardsonii	EUST6	U	U	U	C, U	C	.	.	.
.	.	.	.	7101	rebotel	Eugenia	suzukii	EUSU9	U	P, U	U	U	.	P	.	.
.	.	.	.	7102	atoto	Eugenia	thompsonii	EUTH4	U	P, U	U	U	.	P	.	.
.	.	.	.	7103	Underwood's stopper	Eugenia	underwoodii	EUUN	U	U	U	C, U	C	.	.	.
.	.	.	.	7104	Surinam cherry	Eugenia	uniflora	EUUN2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7105	aridland stopper	Eugenia	xerophytica	EUXE	U	U	U	C, U	C	.	.	.
.	.	.	.	7123	Euodia hortensis	Euodia	hortensis	EUHO5	U	P, U	U	U	.	P	.	.
.	.	.	.	7124	kertub	Euodia	nitida	EUNI8	U	P, U	U	U	.	P	.	.
.	.	.	.	7125	beror	Euodia	palawensis	EUPA29	U	P, U	U	U	.	P	.	.
.	.	.	.	7126	Euodia ponapensis	Euodia	ponapensis	EUPO15	U	P, U	U	U	.	P	.	.
.	.	.	.	7128	Euodia trichantha	Euodia	trichantha	EUTR13	U	P, U	U	U	.	P	.	.
.	.	.	.	7109	Mexican shrubby spurge	Euphorbia	cotinifolia	EUCO24	U	U	U	C, U	C	.	.	.
.	.	.	.	7110	Kauai spurge	Euphorbia	haeleeleana	EUHA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7111	mottled spurge	Euphorbia	lactea	EULA8	U	U	U	C, U	C	.	.	.

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.	.	.	.	7112	Indian spurgetree	Euphorbia	neriifolia	EUNE4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7113	manchineel berry	Euphorbia	petiolaris	EUPE8	U	U	U	C, U	C	.	.	.
.	.	.	.	7114	poinsettia	Euphorbia	pulcherrima	EUPU9	U	P, U	U	U	.	P	.	.
.	.	.	.	7115	spurge	Euphorbia	spp.	EUPHO	U	P, U	U	U	.	P	.	.
.	.	.	.	7116	Indiantree spurge	Euphorbia	tirucalli	EUTI	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7119	anini	Eurya	sandwicensis	EUSA6	U	P, U	U	U	.	P	.	.
.	.	.	.	7129	blinding tree	Excoecaria	agallocha	EXAG	U	P, U	U	U	.	P	.	.
.	.	.	.	7131	hulumoa	Exocarpos	gaudichaudii	EXGA	U	P, U	U	U	.	P	.	.
.	.	.	.	7133	kotop	Exorrhiza	ponapensis	EXPO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7135	Caribbean princewood	Exostema	caribaeum	EXCA	U	U	U	C, U	C	.	.	.
.	.	.	.	7136	plateado	Exostema	ellipticum	EXEL	U	U	U	C, U	C	.	.	.
.	.	.	.	7137	Exostema sanctae-luciae	Exostema	sanctae-luciae	EXSA2	U	U	U	C, U	C	.	.	.
.	.	.	.	874	butterbough, inkwood	Exothea	paniculata	EXPA	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7141	pualulu	Fagraea	berteroana	FABE	U	P, U	U	U	.	P	.	.
.	.	.	.	7142	ksid	Fagraea	ksid	FAKS	U	P, U	U	U	.	P	.	.
.	.	.	.	531	American beech	Fagus	grandifolia	FAGR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5983	European beech	Fagus	sylvatica	FASY	U	U	U	U	.	.	U	.
.	.	.	.	7144	peacocksplume	Falcataria	moluccana	FAMO	U	P, U	U	U	.	P	.	.
.	.	.	.	915	other palms	Family Arecaceae	not listed above	ARECA	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	7146	false coffee	Faramea	occidentalis	FAOC	U	U	U	C, U	C	.	.	.
.	.	.	.	7147	feijoa	Feijoa	sellowiana	FESE2	U	U	U	U	.	.	U	.
.	.	.	.	7148	Jamaican cherry fig	Ficus	americana	FIAM	U	U	U	C, U	C	.	.	.
.	.	.	.	876	Florida strangler fig	Ficus	aurea	FIAU	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	7153	Roxburgh fig	Ficus	auriculata	FIAU3	U	U	U	U	.	.	U	.
.	.	.	.	7149	Indian banyan	Ficus	benghalensis	FIBE2	U	U	U	C, U	C	.	.	.
.	.	.	.	7150	weeping fig	Ficus	benjamina	FIBE	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7151	edible fig	Ficus	carica	FICA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	877	wild banyantree, shortleaf fig	Ficus	citrifolia	FICI	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7152	Ficus copiosa	Ficus	copiosa	FICO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7154	brown-woolly fig	Ficus	drupacea	FIDR3	U	U	U	C, U	C	.	.	.
.	.	.	.	7155	Indian rubberplant	Ficus	elastica	FIEL	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7156	mati	Ficus	godeffroyi	FIGO	U	P, U	U	U	.	P	.	.
.	.	.	.	7158	Ficus lutea	Ficus	lutea	FILU	U	U	U	C, U	C	.	.	.
.	.	.	.	7159	fiddleleaf fig	Ficus	lyrata	FILY	U	U	U	C, U	C	.	.	.
.	.	.	.	7160	Chinese banyan	Ficus	microcarpa	FIMI2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7162	tibig	Ficus	nota	FINO3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7163	aoa	Ficus	obliqua	FIOB3	U	P, U	U	U	.	P	.	.
.	.	.	.	7164	amate	Ficus	obtusifolia	FIOB	U	U	U	C, U	C	.	.	.
.	.	.	.	7165	aoa	Ficus	prolixa	FIPR2	U	P, U	U	U	.	P	.	.
.	.	.	.	7166	peepul tree	Ficus	religiosa	FIRE3	U	U	U	C, U	C	.	.	.

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.	.	.	.	7167	Port Jackson fig	Ficus	rubiginosa	FIRU4	U	P, U	U	U	.	P	.	.
.	.	.	.	7168	lulk, banyan	Ficus	saffordii	FISA	U	P, U	U	U	.	P	.	.
.	.	.	.	7169	mati vao	Ficus	scabra	FISC3	U	P, U	U	U	.	P	.	.
.	.	.	.	7171	fig	Ficus	spp.	FICUS	U	P, U	U	U	.	P	.	.
.	.	.	.	7173	jaguey	Ficus	stahlii	FIST	U	U	U	C, U	C	.	.	.
.	.	.	.	7174	sycamore fig	Ficus	sycomorus	FISY2	U	U	U	C, U	C	.	.	.
.	.	.	.	7175	Chinese banyan	Ficus	thonningii	FITH2	U	P, U	U	U	.	P	.	.
.	.	.	.	7176	mati	Ficus	tinctoria	FITI2	U	P, U	U	U	.	P	.	.
.	.	.	.	7177	jaguey blanco	Ficus	trigonata	FITR	U	U	U	C, U	C	.	.	.
.	.	.	.	7178	mati	Ficus	uniauriculata	FIUN	U	P, U	U	U	.	P	.	.
.	.	.	.	7179	higo	Ficus	virens	FIVI3	U	P, U	U	U	.	P	.	.
.	.	.	.	7180	Finschia chloroxantha	Finschia	chloroxantha	FICH	U	P, U	U	U	.	P	.	.
.	.	.	.	7181	Chinese parasoltree	Firmiana	simplex	FISI2	U	U	U	U	.	.	U	.
.	.	.	.	7182	burrdaisytree	Fitchia	speciosa	FISP3	U	P, U	U	U	.	P	.	.
.	.	.	.	7184	governor's plum	Flacourtia	indica	FLIN	U	U	U	C, U	C	.	.	.
.	.	.	.	7185	batoko plum	Flacourtia	inermis	FLIN3	U	U	U	C, U	C	.	.	.
.	.	.	.	7186	filimoto	Flacourtia	rukam	FLRU2	U	P, U	U	U	.	P	.	.
.	.	.	.	7188	Queensland maple	Flindersia	brayleyana	FLBR	U	P, U	U	U	.	P	.	.
.	.	.	.	7190	Flueggea acidoton	Flueggea	acidoton	FLAC	U	U	U	C, U	C	.	.	.
.	.	.	.	7191	poumuli	Flueggea	flexuosa	FLFL4	U	P, U	U	U	.	P	.	.
.	.	.	.	7192	mehamehame	Flueggea	neowawraea	FLNE	U	P, U	U	U	.	P	.	.
.	.	.	.	7194	inkbush	Forestiera	eggersiana	FOEG	U	U	U	C, U	C	.	.	.
.	.	.	.	7195	caca ravet	Forestiera	rhamnifolia	FORH	U	U	U	C, U	C	.	.	.
.	.	.	.	7196	Florida swampprivet	Forestiera	segregata	FOSE	U	U	U	C, U	C	.	.	.
.	.	.	.	7198	oval kumquat	Fortunella	margarita	FOMA2	U	U	U	C, U	C	.	.	.
.	.	.	.	7202	West Indian buckthorn	Frangula	sphaerosperma	FRSPL	U	U	U	C, U	C	.	.	.
.	.	.	.	7203	Franklin tree	Franklinia	alatamaha	FRAL	U	U	U	U	.	.	U	.
.	.	.	.	541	white ash	Fraxinus	americana	FRAM2	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
.	.	.	.	5491	Berlandier ash	Fraxinus	berlandieriana	FRBE	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	548	Carolina ash	Fraxinus	caroliniana	FRCA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5492	European ash	Fraxinus	excelsior	FREX80	U	U	U	U	.	.	U	.
.	.	.	.	542	Oregon ash	Fraxinus	latifolia	FRLA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	543	black ash	Fraxinus	nigra	FRNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	5493	Caucasian ash	Fraxinus	oxycarpa	FROX	U	U	U	U	.	.	U	.
.	.	.	.	544	green ash	Fraxinus	pennsylvanica	FRPE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	545	pumpkin ash	Fraxinus	profunda	FRPR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	546	blue ash	Fraxinus	quadrangulata	FRQU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	549	Texas ash	Fraxinus	texensis	FRTE	R, U	PNWS, U	R, U	R, U	.	.	.	P2

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.	.	.	.	7206	shamel ash	Fraxinus	uhdei	FRUH	U	P, U	U	C, U	C	P	.	.
.	.	.	.	547	velvet ash	Fraxinus	velutina	FRVE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7207	Bolivian fuchsia	Fuchsia	boliviana	FUBO	U	P, U	U	U	.	P	.	.
.	.	.	.	7208	shrubby fuchsia	Fuchsia	paniculata	FUPA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7210	silkrubber	Funtumia	elastica	FUEL	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7212	Gourka	Garcinia	dulcis	GADU3	U	U	U	C, U	C	.	.	.
.	.	.	.	7213	lemon saptree	Garcinia	hessii	GAHE5	U	U	U	C, U	C	.	.	.
.	.	.	.	7214	mangosteen	Garcinia	mangostana	GAMA10	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7215	tilol	Garcinia	matsudai	GAMA8	U	P, U	U	U	.	P	.	.
.	.	.	.	7216	.	Garcinia	myrtifolia	GAMY	U	P, U	U	U	.	P	.	.
.	.	.	.	7217	konpuil	Garcinia	ponapensis	GAPO4	U	P, U	U	U	.	P	.	.
.	.	.	.	7218	palo de cruz	Garcinia	portoricensis	GAPO2	U	U	U	C, U	C	.	.	.
.	.	.	.	7220	Garcinia quadrilocularis	Garcinia	quadrilocularis	GAQU2	U	P, U	U	U	.	P	.	.
.	.	.	.	7219	tilol	Garcinia	rumiyo	GARU3	U	P, U	U	U	.	P	.	.
.	.	.	.	7223	Garcinia xanthochymus	Garcinia	xanthochymus	GAXA	U	U	U	C, U	C	.	.	.
.	.	.	.	7224	forest gardenia	Gardenia	brighamii	GABR	U	P, U	U	U	.	P	.	.
.	.	.	.	7225	Oahu gardenia	Gardenia	mannii	GAMA6	U	P, U	U	U	.	P	.	.
.	.	.	.	7226	Remys gardenia	Gardenia	remyi	GARE	U	P, U	U	U	.	P	.	.
.	.	.	.	7227	gardenia	Gardenia	spp.	GARDE	U	P, U	U	U	.	P	.	.
.	.	.	.	7228	Tahitian gardenia	Gardenia	taitensis	GATA	U	P, U	U	U	.	P	.	.
.	.	.	.	7229	manuai vivao	Garuga	floribunda	GAFL8	U	P, U	U	U	.	P	.	.
.	.	.	.	7231	llume	Gaussia	attenuata	GAAT	U	U	U	C, U	C	.	.	.
.	.	.	.	7233	taipoipo	Geniostoma	rupestre	GERU3	U	P, U	U	U	.	P	.	.
.	.	.	.	7235	jagua	Genipa	americana	GEAM	U	U	U	C, U	C	.	.	.
.	.	.	.	7237	arbol de Navidad	Gesneria	pedunculosa	GEPE4	U	U	U	C, U	C	.	.	.
.	.	.	.	561	ginkgo, maidenhair tree	Ginkgo	biloba	GIBI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7239	bastard gregre	Ginoria	rohrii	GIRO	U	U	U	C, U	C	.	.	.
.	.	.	.	7241	Gironniera celtidifolia	Gironniera	celtidifolia	GICE2	U	P, U	U	U	.	P	.	.
.	.	.	.	551	waterlocust	Gleditsia	aquatica	GLAQ	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	552	honeylocust	Gleditsia	triacanthos	GLTR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7245	quickstick	Gliricidia	sepium	GLSE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7247	masame	Glochidion	cuspidatum	GLCU	U	P, U	U	U	.	P	.	.
.	.	.	.	7257	Glochidion kanehirae	Glochidion	kanehirae	GLKA	U	P, U	U	U	.	P	.	.
.	.	.	.	7248	Glochidion marianum	Glochidion	marianum	GLMA9	U	P, U	U	U	.	P	.	.
.	.	.	.	7250	Glochidion	Glochidion	spp.	GLOCH	U	P, U	U	U	.	P	.	.
.	.	.	.	7255	flower axistree	Glycosmis	parviflora	GLPA4	U	U	U	U	.	.	U	.
.	.	.	.	7251	belau	Gmelina	elliptica	GMEL	U	P, U	U	U	.	P	.	.
.	.	.	.	7252	blacheos	Gmelina	palawensis	GMPA	U	P, U	U	U	.	P	.	.

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.	.	.	.	7254	Gnetum gnemon	Gnetum	gnemon	GNGN	U	P, U	U	U	.	P	.	.
.	.	.	.	7256	mata buey	Goetzea	elegans	GOEL	U	U	U	C, U	C	.	.	.
.	.	.	.	7258	grand merisier	Gomidesia	lindeniana	GOLI	U	U	U	C, U	C	.	.	.
.	.	.	.	7260	Goniothalamus carolinensis	Goniothalamus	carolinensis	GOCA2	U	P, U	U	U	.	P	.	.
.	.	.	.	555	loblolly-bay	Gordonia	lasianthus	GOLA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	3	.	.	7262	Creole cotton	Gossypium	barbadense	GOBA	U	P, U	U	C, U	C	P	.	.
.	3	.	.	7264	Gossypium hirsutum	Gossypium	hirsutum	GOHIH2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7268	Graffenrieda ottoschulzii	Graffenrieda	ottoschulzii	GROT	U	U	U	C, U	C	.	.	.
.	.	.	.	7272	kahiliflower	Grevillea	banksii	GRBA	U	P, U	U	U	.	P	.	.
.	.	.	.	7273	silkoak	Grevillea	robusta	GRRO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7279	lignum-vitae	Guaiacum	officinale	GUOF	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7280	holywood	Guaiacum	sanctum	GUSA	U	U	U	C, U	C	.	.	.
.	.	.	.	7282	paipai	Guamia	mariannae	GUMA4	U	P, U	U	U	.	P	.	.
.	.	.	.	882	beeftree, longleaf blolly	Guapira	discolor	GUDI	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7285	black mampoo	Guapira	fragrans	GUFR	U	U	U	C, U	C	.	.	.
.	.	.	.	7286	corcho prieto	Guapira	obtusata	GUOB	U	U	U	C, U	C	.	.	.
.	.	.	.	7288	alligatorwood	Guarea	glabra	GUGL3	U	U	U	C, U	C	.	.	.
.	.	.	.	7290	American muskwood	Guarea	guidonia	GUGU	U	U	U	C, U	C	.	.	.
.	.	.	.	7294	haya minga	Guatteria	blainii	GUBL	U	U	U	C, U	C	.	.	.
.	.	.	.	7295	haya blanca	Guatteria	caribaea	GUCA2	U	U	U	C, U	C	.	.	.
.	.	.	.	7298	bastardcedar	Guazuma	ulmifolia	GUUL	U	U	U	C, U	C	.	.	.
.	.	.	.	7299	hammock velvetseed	Guettarda	elliptica	GUEL	U	U	U	C, U	C	.	.	.
.	.	.	.	7300	frogwood	Guettarda	krugii	GUKR	U	U	U	C, U	C	.	.	.
.	.	.	.	7302	cucubano de vieques	Guettarda	odorata	GUOD	U	U	U	C, U	C	.	.	.
.	.	.	.	7303	cucubano	Guettarda	ovalifolia	GUOV	U	U	U	C, U	C	.	.	.
.	.	.	.	7305	roseta	Guettarda	pungens	GUPU	U	U	U	C, U	C	.	.	.
.	.	.	.	7306	wild guave	Guettarda	scabra	GUSC	U	U	U	C, U	C	.	.	.
.	.	.	.	7307	puapua	Guettarda	speciosa	GUSP3	U	P, U	U	U	.	P	.	.
.	.	.	.	7309	cucubano de monte	Guettarda	valenzuelana	GUVA	U	U	U	C, U	C	.	.	.
.	.	.	.	7311	rhoifolia	Guioa	rhoifolia	GURH	U	P, U	U	U	.	P	.	.
.	.	.	.	7313	bochela uchererak, uch	Gulubia	palauensis	GUPA	U	P, U	U	U	.	P	.	.
.	.	.	.	7315	West Indian false box	Gyminda	latifolia	GYLA	U	U	U	C, U	C	.	.	.
.	.	.	.	7317	oysterwood	Gymnanthes	lucida	GYLU	U	U	U	C, U	C	.	.	.
.	.	.	.	571	Kentucky coffeetree	Gymnocladus	dioicus	GYDI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7319	vilivili	Gyrocarpus	americanus	GYAM2	U	P, U	U	U	.	P	.	.

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.	.	.	.	7321	bloodwoodtree	Haematoxylum	campechianum	HACA2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7327	palo de hueso	Haenianthus	salicifolius	HASAO	U	U	U	C, U	C	.	.	.
.	.	.	.	581	Carolina silverbell	Halesia	carolina	HACA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	582	two-wing silverbell	Halesia	diptera	HADI3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7328	mountain silverbell	Halesia	tetraptera	HATE3	U	U	U	U	.	.	U	.
.	.	.	.	7330	scarletbush	Hamelia	patens	HAPA3	U	U	U	C, U	C	.	.	.
.	.	.	.	7332	Haplolobus floribundus	Haplolobus	floribundus	HAFL	U	P, U	U	U	.	P	.	.
.	.	.	.	7333	South African wild plum	Harpephyllum	caffrum	HACA10	U	U	U	U	.	.	U	.
.	.	.	.	7334	fa`aili	Harpullia	arborea	HAAR4	U	P, U	U	U	.	P	.	.
.	.	.	.	7335	haujillo	Havardia	pallens	HAPA10	U	U	U	U	.	.	U	.
.	.	.	.	7336	false locust	Hebestigma	cubense	HECU10	U	U	U	C, U	C	.	.	.
.	.	.	.	7338	denticulata	Hedycarya	denticulata	HEDE14	U	P, U	U	U	.	P	.	.
.	.	.	.	7341	cigarbush	Hedyosmum	arborescens	HEAR	U	U	U	C, U	C	.	.	.
.	.	.	.	7343	Fosbergs starviolet	Hedyotis	fosbergii	HEFO5	U	P, U	U	U	.	P	.	.
.	.	.	.	7344	manono	Hedyotis	hillebrandii	HEHI8	U	P, U	U	U	.	P	.	.
.	.	.	.	7345	starviolet	Hedyotis	spp.	HEDYO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7346	variable starviolet	Hedyotis	terminalis	HETE21	U	P, U	U	U	.	P	.	.
.	.	.	.	7347	screwtree	Helicteres	jamaicensis	HEJA	U	U	U	C, U	C	.	.	.
.	.	.	.	7349	white moho	Heliocarpus	popayanensis	HEPO4	U	P, U	U	U	.	P	.	.
.	.	.	.	7353	camasey peludo	Henriettea	fascicularis	HEFA5	U	U	U	C, U	C	.	.	.
.	.	.	.	7354	MacFadyen's camasey	Henriettea	macfadyenii	HEMA11	U	U	U	C, U	C	.	.	.
.	.	.	.	7355	thinleaf camasey	Henriettea	membranifolia	HEME5	U	U	U	C, U	C	.	.	.
.	.	.	.	7357	jusillo	Henriettea	squamulosum	HESQ	U	U	U	C, U	C	.	.	.
.	.	.	.	7359	ufa	Heritiera	littoralis	HELI9	U	P, U	U	U	.	P	.	.
.	.	.	.	7360	ufa halemtano	Heritiera	longipetiolata	HELO12	U	P, U	U	U	.	P	.	.
.	.	.	.	7368	Hernandia labyrinthica	Hernandia	labyrinthica	HELA27	U	P, U	U	U	.	P	.	.
.	.	.	.	7363	pipi	Hernandia	moerenhoutiana	HEMO13	U	P, U	U	U	.	P	.	.
.	.	.	.	7364	pua, Chinese lantern tree	Hernandia	nymphaeifolia	HENY	U	P, U	U	U	.	P	.	.
.	.	.	.	7365	Hernandia ovigera	Hernandia	ovigera	HEOV4	U	P, U	U	U	.	P	.	.
.	.	.	.	7366	mago	Hernandia	sonora	HESO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7370	Lanai island-aster	Hesperomannia	arborescens	HEAR9	U	P, U	U	U	.	P	.	.
.	.	.	.	7371	Maui island-aster	Hesperomannia	arbuscula	HEAR10	U	P, U	U	U	.	P	.	.
.	.	.	.	7372	Kauai island-aster	Hesperomannia	lydgatei	HELY	U	P, U	U	U	.	P	.	.
.	.	.	.	7374	toyon	Heteromeles	arbutifolia	HEAR5	U	P, U	U	U	.	P	.	.
.	.	.	.	7377	palma brava	Heterospathe	elata	HEEL9	U	P, U	U	U	.	P	.	.
.	.	.	.	7381	para rubber tree	Hevea	brasiliensis	HEBR8	U	P, U	U	U	.	P	.	.
.	.	.	.	7384	hau kuahiwi	Hibiscadelphus	bombycinus	HIBO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7385	lava hau kuahiwi	Hibiscadelphus	crucibracteatus	HICR	U	P, U	U	U	.	P	.	.
.	.	.	.	7386	Kauai hau kuahiwi	Hibiscadelphus	distans	HIDI	U	P, U	U	U	.	P	.	.

Non-Urban Exclu-sion	NFS Region Exclu-sion	Main-land Exclu-sion	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
.	.	.	.	7387	Kilauea hau kuahiwi	Hibiscadelphus	giffardianus	HIGI	U	P, U	U	U	.	P	.	.
.	.	.	.	7388	Hualalai hau kuahiwi	Hibiscadelphus	hualalaiensis	HIHU	U	P, U	U	U	.	P	.	.
.	.	.	.	7389	hau kuahiwi	Hibiscadelphus	puakuahiwi	HIPU2	U	P, U	U	U	.	P	.	.
.	.	.	.	7391	Maui hau kuahiwi	Hibiscadelphus	wilderianus	HIWI	U	P, U	U	U	.	P	.	.
.	.	.	.	7392	Woods hau kuahiwi	Hibiscadelphus	woodii	HIWO	U	P, U	U	U	.	P	.	.
.	.	.	.	7393	white rosemallow	Hibiscus	arnottianus	HIAR	U	P, U	U	U	.	P	.	.
.	.	.	.	7397	Brackenridges rosemallow	Hibiscus	brackenridgei	HIBR	U	P, U	U	U	.	P	.	.
.	.	.	.	7401	lemonyellow rosemallow	Hibiscus	calyphyllus	HICA6	U	P, U	U	U	.	P	.	.
.	.	.	.	7402	red Kauai rosemallow	Hibiscus	clayi	HICL	U	P, U	U	U	.	P	.	.
.	.	.	.	7403	mahoe	Hibiscus	elatus	HIEL	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7404	red rosemallow	Hibiscus	kokio	HIKO	U	P, U	U	U	.	P	.	.
.	.	.	.	7407	largeleaf rosemallow	Hibiscus	macrophyllus	HIMA5	U	P, U	U	U	.	P	.	.
.	.	.	.	7408	Dixie rosemallow	Hibiscus	mutabilis	HIMU3	U	P, U	U	U	.	P	.	.
.	.	.	.	7409	seaside mahoe	Hibiscus	pernambucensis	HIPE3	U	U	U	C, U	C	.	.	.
.	.	.	.	7410	shoeblackplant	Hibiscus	rosa-sinensis	HIRO3	U	U	U	C, U	C	.	.	.
.	.	.	.	7412	sea hibiscus	Hibiscus	tiliaceus	HITI	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7413	white Kauai rosemallow	Hibiscus	waimeae	HIWA	U	P, U	U	U	.	P	.	.
.	.	.	.	883	manchineel	Hippomane	mancinella	HIMA2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7418	teta de burra cinarron	Hirtella	rugosa	HIRU2	U	U	U	C, U	C	.	.	.
.	.	.	.	7420	pigeonberry	Hirtella	triandra	HITR3	U	U	U	C, U	C	.	.	.
.	.	.	.	8008	fanuamamala	Homalanthus	acuminatus	HOAC4	U	P, U	U	U	.	P	.	.
.	.	.	.	8009	fanuamamala	Homalanthus	nutans	HONU3	U	P, U	U	U	.	P	.	.
.	.	.	.	7422	white cogwood	Homalium	racemosum	HORA	U	U	U	C, U	C	.	.	.
.	.	.	.	7424	Homalium whitmeeanum	Homalium	whitmeeanum	HOWH	U	P, U	U	U	.	P	.	.
.	.	.	.	7427	chemeklachel, eumail	Horsfieldia	amklaal	HOAM2	U	P, U	U	U	.	P	.	.
.	.	.	.	7428	ersachel	Horsfieldia	novoguineensis	HONO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7429	Horsfieldia nunu	Horsfieldia	nunu	HONU2	U	P, U	U	U	.	P	.	.
.	.	.	.	7430	chersachel	Horsfieldia	palauensis	HOPA10	U	P, U	U	U	.	P	.	.
.	.	.	.	7432	Japanese raisintree	Hovenia	dulcis	HODU2	U	U	U	U	.	.	U	.
.	.	.	.	7433	sentrypalm	Howeia	forsteriana	HOFO	U	U	U	U	.	.	U	.
.	.	.	.	7434	sandbox tree	Hura	crepitans	HUCR	U	U	U	C, U	C	.	.	.
.	.	.	.	7438	cedro macho	Hyeronima	clusioides	HYCL	U	U	U	C, U	C	.	.	.

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.	.	.	.	7442	West Indian locust, Brazilian cherry, stinkingtoe	Hymenaea	courbaril	HYCO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7445	inkwood	Hypelate	trifoliata	HYTR	U	U	U	C, U	C	.	.	.
.	.	.	.	7446	limestone snakevine	Hyperbaena	laurifolia	HYLA8	U	U	U	C, U	C	.	.	.
.	.	.	.	7453	Hawaii holly	Ilex	anomala	ILAN	U	P, U	U	U	.	P	.	.
.	.	.	.	7454	English holly	Ilex	aquifolium	ILAQ80	U	P, U	U	U	.	P	.	.
.	.	.	.	7455	dahoon	Ilex	cassine	ILCA	U	U	U	C, U	C	.	.	.
.	.	.	.	7456	te	Ilex	cookii	ILCO3	U	U	U	C, U	C	.	.	.
.	.	.	.	7457	maconcona	Ilex	guianensis	ILGU	U	U	U	C, U	C	.	.	.
.	.	.	.	7458	Caribbean holly	Ilex	macfadyenii	ILMA	U	U	U	C, U	C	.	.	.
.	.	.	.	7459	Puerto Rico holly	Ilex	nitida	ILNI	U	U	U	C, U	C	.	.	.
.	.	.	.	591	American holly	Ilex	opaca	ILOP	R, U	U	R, U	R, U	.	.	.	P2
.	.	.	.	7460	mate	Ilex	paraguariensis	ILPA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7462	gongolin	Ilex	sideroxyloides	ILSI	U	U	U	C, U	C	.	.	.
.	.	.	.	7463	Sintenis' holly	Ilex	sintenisii	ILSI2	U	U	U	C, U	C	.	.	.
.	.	.	.	7465	Urban's holly	Ilex	urbaniana	ILUR	U	U	U	C, U	C	.	.	.
NUE	.	.	.	7469	yaupon	Ilex	vomitoria	ILVO	U	U	U	U	.	.	U	.
.	.	.	.	7472	ice cream bean	Inga	edulis	INED	U	P, U	U	U	.	P	.	.
.	.	.	.	7470	sacky sac bean	Inga	laurina	INLA	U	U	U	C, U	C	.	.	.
.	.	.	.	7471	Inga nobilis	Inga	nobilis	INNOQ	U	U	U	C, U	C	.	.	.
.	.	.	.	7467	inga	Inga	spp.	INGA	U	U	U	C, U	C	.	.	.
.	.	.	.	7474	river koko	Inga	vera	INVE	U	U	U	C, U	C	.	.	.
.	.	.	.	7475	ifi	Inocarpus	fagifer	INFA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7477	ifilele	Intsia	bijuga	INBI	U	P, U	U	U	.	P	.	.
.	.	.	.	7479	palo de hierro	Ixora	ferrea	IXFE	U	U	U	C, U	C	.	.	.
.	.	.	.	7481	white jungleflame	Ixora	thwaitesii	IXTH	U	U	U	C, U	C	.	.	.
.	.	.	.	7482	black poui	Jacaranda	mimosifolia	JAMI	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7485	braceletwood	Jacquinia	armillaris	JAAR2	U	U	U	C, U	C	.	.	.
.	.	.	.	7487	bois bande	Jacquinia	berteroi	JABE	U	U	U	C, U	C	.	.	.
.	.	.	.	7491	Barbados nut	Jatropha	curcas	JACU2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7492	wild oilnut	Jatropha	hernandiifolia	JAHE	U	U	U	C, U	C	.	.	.
.	.	.	.	7493	coralbush	Jatropha	multifida	JAMU	U	U	U	C, U	C	.	.	.
.	.	.	.	604	southern California black walnut	Juglans	californica	JUCA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	601	butternut	Juglans	cinerea	JUCI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	603	northern California black walnut	Juglans	hindsii	JUHI	R, U	PNWS, U	U	U	.	.	.	P2
.	.	.	.	7495	West Indian walnut	Juglans	jamaicensis	JUJA	U	U	U	C, U	C	.	.	.
.	.	.	.	606	Arizona walnut	Juglans	major	JUMA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	605	Texas walnut	Juglans	microcarpa	JUMI	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	602	black walnut	Juglans	nigra	JUNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7496	English walnut	Juglans	regia	JURE80	U	U	U	U	.	.	U	.

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.	.	.	.	7497	ketoguit	Kayea	pacifica	KAPA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7499	Khaya anthotheca	Khaya	anthotheca	KHAN	U	U	U	C, U	C	.	.	.
.	.	.	.	7501	Senegal mahogany	Khaya	senegalensis	KHSE2	U	U	U	C, U	C	.	.	.
.	.	.	.	7503	Kigelia africana	Kigelia	africana	KIAF	U	U	U	C, U	C	.	.	.
.	.	.	.	7506	guest tree	Kleinhovia	hospita	KLHO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7507	goldenrain tree	Koelreuteria	bipinnata	KOBI3	U	U	U	U	.	.	U	.
.	.	.	.	7515	goldenrain tree	Koelreuteria	paniculata	KOPA	U	U	U	U	.	.	U	.
.	.	.	.	7509	Molokai treecotton	Kokia	cookei	KOCO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7510	Hawaii treecotton	Kokia	drynarioides	KODR	U	P, U	U	U	.	P	.	.
.	.	.	.	7511	Kauai treecotton	Kokia	kauaiensis	KOKA	U	P, U	U	U	.	P	.	.
.	.	.	.	7512	Wailupe Valley treecotton	Kokia	lanceolata	KOLA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7514	leadwood	Krugiodendron	ferreum	KRFE	U	U	U	C, U	C	.	.	.
.	.	.	.	7516	burgan	Kunzea	ericoides	KUER	U	P, U	U	U	.	P	.	.
.	.	.	.	7518	summit labordia	Labordia	fagraeoidea	LAFA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7519	bog labordia	Labordia	hedyosmifolia	LAHE2	U	P, U	U	U	.	P	.	.
.	.	.	.	7520	mountain labordia	Labordia	hirtella	LAHI5	U	P, U	U	U	.	P	.	.
.	.	.	.	7521	Waianae Range labordia	Labordia	kaalae	LAKA	U	P, U	U	U	.	P	.	.
.	.	.	.	7522	Wahiawa Mountain labordia	Labordia	lydgatei	LALY2	U	P, U	U	U	.	P	.	.
.	.	.	.	7523	labordia	Labordia	spp.	LABOR	U	P, U	U	U	.	P	.	.
.	.	.	.	7524	paleflower labordia	Labordia	tinifolia	LATI2	U	P, U	U	U	.	P	.	.
.	.	.	.	7528	Lanai labordia	Labordia	triflora	LATR4	U	P, U	U	U	.	P	.	.
.	.	.	.	7529	Nevada peavine	Labordia	waiolani	LAWA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7531	golden chain tree	Laburnum	anagyroides	LAAN2	U	U	U	U	.	.	U	.
.	.	.	.	7530	cuero de rana	Laetia	procera	LAPR2	U	U	U	C, U	C	.	.	.
.	.	.	w	7532	crapemyrtle	Lagerstroemia	indica	LAIN	.	U	U	C, U	C	.	.	.
.	.	.	.	7533	pride of India	Lagerstroemia	speciosa	LASP	U	P, U	U	C, U	C	P	.	.
.	.	.	.	988	white-mangrove	Laguncularia	racemosa	LARA2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7539	Langsat	Lansium	domesticum	LADO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7541	nino de cota	Laplacea	portoricensis	LAPO	U	U	U	C, U	C	.	.	.
.	.	.	.	7543	bluelatan	Latania	loddigesii	LALO	U	P, U	U	U	.	P	.	.
.	.	.	.	7550	henna	Lawsonia	inermis	LAIN5	U	U	U	C, U	C	.	.	.
.	.	.	.	7552	Krug's roughleaf	Leandra	krugiana	LEKR	U	U	U	C, U	C	.	.	.
.	.	.	.	7556	pitahaya	Leptocereus	quadricostatus	LEQU	U	U	U	C, U	C	.	.	.
.	.	.	.	7558	large-leaf yellow teatree	Leptospermum	morrisonii	LEMO20	U	P, U	U	U	.	P	.	.
.	.	.	.	7559	common teatree	Leptospermum	petersonii	LEPE23	U	P, U	U	U	.	P	.	.
.	.	.	.	7560	common teatree	Leptospermum	polygalifolim	LEPO22	U	P, U	U	U	.	P	.	.
.	.	.	.	7561	broom teatree	Leptospermum	scoparium	LESC2	U	P, U	U	U	.	P	.	.
.	.	.	.	7562	teatree	Leptospermum	spp.	LEPTO4	U	P, U	U	U	.	P	.	.

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.	.	.	.	7565	white leadtree	Leucaena	leucocephala	LELE10	U	P, U	U	C, U	C	P	.	.
.	.	.	.	869	Great leucaene	Leucaena	pulverulenta	LEPU3	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	7567	littleleaf leadtree	Leucaena	retusa	LERE5	U	U	U	U	.	.	U	.
.	.	.	.	7569	Maria laurel	Licaria	brittoniana	LIBR5	U	U	U	C, U	C	.	.	.
.	.	.	.	7570	Puerto Rico cinnamon	Licaria	parvifolia	LIPA9	U	U	U	C, U	C	.	.	.
.	.	.	.	7573	pepperleaf sweetwood	Licaria	triandra	LITR	U	U	U	C, U	C	.	.	.
NUE	.	.	w	7577	Japanese privet	Ligustrum	japonicum	LIJA	.	U	U	U	.	.	U	.
NUE	.	.	w	7578	glossy privet	Ligustrum	lucidum	LILU2	.	U	U	U	.	.	U	.
NUE	.	.	w	7579	California privet	Ligustrum	ovalifolium	LIOV	.	U	U	U	.	.	U	.
.	.	.	.	7571	Oriental sweetgum	Liquidambar	orientalis	LIOR2	.	U	U	U	.	.	U	.
.	.	.	.	611	sweetgum	Liquidambar	styraciflua	LIST2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	621	yellow-poplar	Liriodendron	tulipifera	LITU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7583	Lychee	Litchi	chinensis	LICH4	U	P, U	U	U	.	P	.	.
.	.	.	.	631	tanoak	Lithocarpus	densiflorus	LIDE3	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	7586	papaono	Litsea	samoensis	LISA8	U	P, U	U	U	.	P	.	.
.	.	.	.	7588	fountain palm	Livistona	chinensis	LICH3	U	P, U	U	U	.	P	U	.
.	.	.	.	7590	geno geno	Lonchocarpus	domingensis	LODO5	U	U	U	C, U	C	.	.	.
.	.	.	.	7591	geno	Lonchocarpus	glaucifolius	LOGL2	U	U	U	C, U	C	.	.	.
.	.	.	.	7592	broadleaf lancepod	Lonchocarpus	heptaphyllus	LOHE7	U	U	U	C, U	C	.	.	.
.	.	.	.	7595	vinegartree	Lophostemon	confertus	LOCO9	U	P, U	U	U	.	P	U	.
.	.	.	.	7600	luehea	Luehea	speciosa	LUSP11	U	U	U	C, U	C	.	.	.
.	.	.	.	7602	bakauaine, nana	Lumnitzera	littorea	LULI8	U	P, U	U	U	.	P	.	.
.	.	.	.	7606	Lunania ekmanii	Lunania	ekmanii	LUEK	U	U	U	C, U	C	.	.	.
.	.	.	.	7608	St. Thomas staggerbush	Lyonia	rubiginosa	LYRU2	U	U	U	C, U	C	.	.	.
.	.	.	.	884	false tamarind	Lysiloma	latisiliquum	LYLA3	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7614	macadamia nut tree, pengua	Macadamia	integrifolia	MAIN8	U	P, U	U	U	.	P	.	.
.	.	.	.	7617	Macadamia Nut	Macadamia	tetraphylla	MATE16	U	P, U	U	U	.	P	.	.
.	.	.	.	7618	bedel	Macaranga	carolinensis	MACA25	U	P, U	U	U	.	P	.	.
.	.	.	.	7619	Macaranga grayana	Macaranga	grayana	MAGR	U	P, U	U	U	.	P	.	.
.	.	.	.	7620	lau pata	Macaranga	harveyana	MAHA9	U	P, U	U	U	.	P	.	.
.	.	.	.	7621	pengua	Macaranga	mappa	MAMA28	U	P, U	U	U	.	P	.	.
.	.	.	.	7625	lau fatu	Macaranga	stipulosa	MAST7	U	P, U	U	U	.	P	.	.
.	.	.	.	7626	parasol leaf tree	Macaranga	tanarius	MATA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7627	Macaranga thompsonii	Macaranga	thompsonii	MATH3	U	P, U	U	U	.	P	.	.
.	.	.	.	7628	palo de hoz	Machaerium	lunatum	MALU2	U	U	U	C, U	C	.	.	.
.	.	.	.	7630	Puerto Rico alfilerillo	Machaonia	portoricensis	MAPO6	U	U	U	C, U	C	.	.	.
.	.	.	.	641	Osage-orange	Maclura	pomifera	MAPO	R, U	PNWS, U	R, U	R, U	.	.	.	P2

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.	.	.	.	7632	Maclura tinctoria	Maclura	tinctoria	MATI3	U	U	U	C, U	C	.	.	.
.	.	.	.	7633	umbrella-tree	Maesopsis	eminii	MAEM2	U	U	U	C, U	C	.	.	.
.	.	.	.	651	cucumbertree	Magnolia	acuminata	MAAC	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	655	mountain or Fraser magnolia	Magnolia	fraseri	MAFR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	652	southern magnolia	Magnolia	grandiflora	MAGR4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	654	bigleaf magnolia	Magnolia	macrophylla	MAMA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7635	Puerto Rico magnolia	Magnolia	portoricensis	MAPO2	U	U	U	C, U	C	.	.	.
.	.	.	.	657	pyramid magnolia	Magnolia	pyramidata	MAPY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
NUE	.	.	.	7637	Oyama magnolia	Magnolia	sieboldii	MASI14	.	U	U	U	.	.	U	.
.	.	.	.	7636	laurel magnolia	Magnolia	splendens	MASP	U	U	U	C, U	C	.	.	.
.	.	.	.	7631	star magnolia	Magnolia	stellata	MAST6	.	.	.	.	.	.	.	.
.	.	.	.	658	umbrella magnolia	Magnolia	tripetala	MATR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	653	sweetbay	Magnolia	virginiana	MAVI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7634	Chinese magnolia	Magnolia	x soulangiana	MASO9	.	.	.	.	.	.	.	.
.	.	.	.	7639	kamala tree	Mallotus	philippensis	MAPH4	U	P, U	U	U	.	P	.	.
.	.	.	.	7642	Mallotus tiliifolius	Mallotus	tiliifolius	MATI4	U	P, U	U	U	.	P	.	.
.	.	.	.	7644	Barbados cherry	Malpighia	emarginata	MAEM	U	U	U	C, U	C	.	.	.
.	.	.	.	7645	palo bronco	Malpighia	fucata	MAFU2	U	U	U	C, U	C	.	.	.
.	.	.	.	7646	wild crapemyrtle	Malpighia	glabra	MAGL6	U	U	U	C, U	C	.	.	.
.	.	.	.	7647	cowhage cherry	Malpighia	infestissima	MAIN5	U	U	U	C, U	C	.	.	.
.	.	.	.	7648	bastard cherry	Malpighia	linearis	MALI2	U	U	U	C, U	C	.	.	.
.	.	.	.	662	southern crab apple	Malus	angustifolia	MAAN3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7649	Siberian crab apple	Malus	baccata	MABA	U	U	U	U	.	.	U	.
.	.	.	.	663	sweet crab apple	Malus	coronaria	MACO5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7650	Japanese flowering crab apple	Malus	floribunda	MAFL80	U	U	U	U	.	.	U	.
.	.	.	.	661	Oregon crab apple	Malus	fusca	MAFU	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	664	prairie crab apple	Malus	ioensis	MAIO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7651	paradise apple	Malus	pumila	MAPU	U	U	U	U	.	.	U	.
.	5, 6, 10	.	.	660	apple spp.	Malus	spp.	MALUS	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	7652	mammee apple	Mammea	americana	MAAM2	U	U	U	C, U	C	.	.	.
.	.	.	.	7653	manapau	Mammea	glauca	MAGL12	U	P, U	U	U	.	P	.	.
.	.	.	.	7654	chopak	Mammea	odorata	MAOD2	U	P, U	U	U	.	P	.	.
.	.	.	.	885	mango	Mangifera	indica	MAIN3	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	7657	kanit	Mangifera	minor	MAMI3	U	P, U	U	U	.	P	.	.
.	.	.	.	7658	saipan mango	Mangifera	odorata	MAOD	U	P, U	U	U	.	P	.	.
.	.	.	.	7660	ceara rubbertree	Manihot	carthaginensis ssp. Glaziovii	MACAG 4	U	P, U	U	U	.	P	.	.
.	.	.	.	7662	bulletwood	Manilkara	bidentata	MABI5	U	U	U	C, U	C	.	.	.

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.	.	.	.	7663	Surinam bulletwood	Manilkara	bidentate var. surinamensis	MABIS	U	U	U	C, U	C	.	.	.
.	.	.	.	7664	pani	Manilkara	dissecta	MADI14	U	P, U	U	U	.	P	.	.
.	.	.	.	7666	kohle	Manilkara	hoshinoi	MAHO5	U	P, U	U	U	.	P	.	.
.	.	.	.	7667	wild dilly	Manilkara	jaimiqui	MAJA2	U	U	U	C, U	C	.	.	.
.	.	.	.	7669	zapote de costa	Manilkara	pleeana	MAPL2	U	U	U	C, U	C	.	.	.
.	.	.	.	7672	udeuid	Manilkara	udoido	MAUD	U	P, U	U	U	.	P	.	.
.	.	.	.	7673	nisperillo	Manilkara	valenzuela	MAVA3	U	U	U	C, U	C	.	.	.
.	.	.	.	7674	sapodilla	Manilkara	zapota	MAZA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7677	palo de cana	Mappia	racemosa	MARA3	U	U	U	C, U	C	.	.	.
.	.	.	.	7679	bkau, apgau	Maranthes	corymbosa	MACO	U	P, U	U	U	.	P	.	.
.	.	.	.	7682	bastard hogberry	Margaritaria	nobilis	MANO	U	U	U	C, U	C	.	.	.
.	.	.	.	7684	beruquillo	Marlierea	sintenisii	MASI3	U	U	U	C, U	C	.	.	.
.	.	.	.	7688	Matayba apetala	Matayba	apetala	MAAP5	U	U	U	C, U	C	.	.	.
.	.	.	.	7689	negra lora	Matayba	domingensis	MADO2	U	U	U	C, U	C	.	.	.
.	.	.	.	7694	mayten	Maytenus	boaria	MABO8	U	U	U	U	.	.	U	.
.	.	.	.	7695	Caribbean mayten	Maytenus	cymosa	MACY2	U	U	U	C, U	C	.	.	.
.	.	.	.	7697	Puerto Rico mayten	Maytenus	elongata	MAEL3	U	U	U	C, U	C	.	.	.
.	.	.	.	7698	white cinnamon	Maytenus	laevigata	MALA8	U	U	U	C, U	C	.	.	.
.	.	.	.	715	Maytenus palauica	Maytenus	palauica	MAPA28	U	P, U	U	U	.	P	.	.
.	.	.	.	7699	ponce mayten	Maytenus	ponceana	MAPO5	U	U	U	C, U	C	.	.	.
.	.	.	.	7700	luluhut	Maytenus	thompsonii	MATH4	U	P, U	U	U	.	P	.	.
.	.	.	.	7702	Mecranium latifolium	Mecranium	latifolium	MELA7	U	U	U	C, U	C	.	.	.
.	.	.	.	7704	Medusanthera carolinensis	Medusanthera	carolinensis	MECA21	U	P, U	U	U	.	P	.	.
.	.	.	.	7705	matamo	Medusanthera	samoensis	MESA11	U	P, U	U	U	.	P	.	.
.	.	.	.	7715	cajeput tree	Melaleuca	linariifolia	MELI7	U	U	U	U	.	.	U	.
.	.	.	.	992	melaleuca	Melaleuca	quinquenervia	MEQU	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	7710	alom	Melanolepis	multiglandulosa	MEMU10	U	P, U	U	U	.	P	.	.
.	.	.	.	993	chinaberry	Melia	azedarach	MEAZ	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	7717	Spanish lime	Melicoccus	bijugatus	MEBI	U	U	U	C, U	C	.	.	.
.	.	.	.	7719	mokihana	Melicope	anisata	MEAN3	U	P, U	U	U	.	P	.	.
.	.	.	.	7720	Ballous melicope	Melicope	balloui	MEBA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7721	uahiapele	Melicope	barbigera	MEBA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7722	Waianae Range melicope	Melicope	christophersenii	MECH2	U	P, U	U	U	.	P	.	.
.	.	.	.	7723	manena	Melicope	cinerea	MECI6	U	P, U	U	U	.	P	.	.
.	.	.	.	7724	kukaemoa	Melicope	clusiifolia	MECL	U	P, U	U	U	.	P	.	.
.	.	.	.	7725	piloula	Melicope	cruciata	MECR5	U	P, U	U	U	.	P	.	.
.	.	.	.	7726	leiohiiaka	Melicope	elliptica	MEEL2	U	P, U	U	U	.	P	.	.

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.	.	.	.	7727	Haleakala melicope	Melicope	haleakalae	MEHA7	U	P, U	U	U	.	P	.	.
.	.	.	.	7728	Haupa Mountain melicope	Melicope	haupuensis	MEHA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7729	mokihana kukae moa	Melicope	hawaiensis	MEHA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7730	Monoa melicope	Melicope	hiiakae	MEHI6	U	P, U	U	U	.	P	.	.
.	.	.	.	7731	Honolulu melicope	Melicope	hosakae	MEHO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7732	Kaala melicope	Melicope	kaalaensis	MEKA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7733	Olokele Valley melicope	Melicope	knudsenii	MEKN	U	P, U	U	U	.	P	.	.
.	.	.	.	7750	soopini	Melicope	latifolia	MERE8	U	P, U	U	U	.	P	.	.
.	.	.	.	7734	Kaholuamanu melicope	Melicope	macropus	MEMA6	U	P, U	U	U	.	P	.	.
.	.	.	.	7735	Makaha Valley melicope	Melicope	makahae	MEMA7	U	P, U	U	U	.	P	.	.
.	.	.	.	7736	Molokai melicope	Melicope	molokaiensis	MEMO6	U	P, U	U	U	.	P	.	.
.	.	.	.	7737	alani	Melicope	mucronulata	MEMU4	U	P, U	U	U	.	P	.	.
.	.	.	.	7738	Oahu melicope	Melicope	oahuensis	MEOA	U	P, U	U	U	.	P	.	.
.	.	.	.	7739	Makawao melicope	Melicope	obovata	MEOB4	U	P, U	U	U	.	P	.	.
.	.	.	.	7740	Honokahua melicope	Melicope	orbicularis	MEOR4	U	P, U	U	U	.	P	.	.
.	.	.	.	7741	Hana melicope	Melicope	ovalis	MEOV	U	P, U	U	U	.	P	.	.
.	.	.	.	7742	eggshape melicope	Melicope	ovata	MEOV2	U	P, U	U	U	.	P	.	.
.	.	.	.	7743	pale melicope	Melicope	pallida	MEPA6	U	P, U	U	U	.	P	.	.
.	.	.	.	7744	Lihue melicope	Melicope	paniculata	MEPA7	U	P, U	U	U	.	P	.	.
.	.	.	.	7745	boxfruit alani	Melicope	peduncularis	MEPE9	U	P, U	U	U	.	P	.	.
.	.	.	.	7746	Kohala Summit melicope	Melicope	pseudoanisata	MEPS	U	P, U	U	U	.	P	.	.
.	.	.	.	7747	hairy melicope	Melicope	puberula	MEPU4	U	P, U	U	U	.	P	.	.
.	.	.	.	7748	fourangle melicope	Melicope	quadrangularis	MEQU3	U	P, U	U	U	.	P	.	.
.	.	.	.	7749	kapu melicope	Melicope	radiata	MERA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7751	roundleaf melicope	Melicope	rotundifolia	MERO3	U	P, U	U	U	.	P	.	.
.	.	.	.	7752	St. Johns melicope	Melicope	saint-johnii	MESA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7753	Mt. Kaala melicope	Melicope	sandwicensis	MESA5	U	P, U	U	U	.	P	.	.
.	.	.	.	7754	melicope	Melicope	spp.	MELIC3	U	P, U	U	U	.	P	.	.
.	.	.	.	7755	volcanic melicope	Melicope	volcanica	MEVO	U	P, U	U	U	.	P	.	.
.	.	.	.	7756	alani wai	Melicope	waialealae	MEWA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7757	Monoa melicope	Melicope	wawraeana	MEWA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7758	kipuka piaula	Melicope	zahlbruckneri	MEZA	U	P, U	U	U	.	P	.	.
.	.	.	.	7759	samoensis	Melicytus	samoensis	MESA9	U	P, U	U	U	.	P	.	.
.	.	.	.	7763	aguacatillo	Meliosma	herbertii	MEHE	U	U	U	C, U	C	.	.	.
.	.	.	.	7764	cacaillo	Meliosma	obtusifolia	MEOB2	U	U	U	C, U	C	.	.	.
.	.	.	.	7766	mao	Melochia	aristata	MEAR16	U	P, U	U	U	.	P	.	.
.	.	.	.	7768	teabush	Melochia	tomentosa	METO4	U	U	U	C, U	C	.	.	.

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.	.	.	.	7769	hierba del soldado	Melochia	umbellata	MEUM3	U	P, U	U	U	.	P	.	.
.	.	.	.	7771	sayafe	Melochia	villosissima var. villosissima	MEVIV	U	P, U	U	U	.	P	.	.
.	.	.	.	7770	sayafe	Melochia	villosissima var. compacta	MEVIC4	U	P, U	U	U	.	P	.	.
.	.	.	.	7774	faniok	Merrilliodendron	megacarpum	MEME12	U	P, U	U	U	.	P	.	.
.	.	.	.	7776	fagufagu	Meryta	macrophylla	MEMA16	U	P, U	U	U	.	P	.	.
.	.	.	.	7777	omechidel	Meryta	senfftiana	MESE11	U	P, U	U	U	.	P	.	.
.	.	.	.	886	Florida poisontree	Metopium	toxiferum	METO3	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	7781	collina	Metrosideros	collina	MEPOP2	U	P, U	U	U	.	P	.	.
.	.	.	.	7782	ohia	Metrosideros	macropus	MEMA4	U	P, U	U	U	.	P	.	.
.	.	.	.	7783	ohia lehua	Metrosideros	polymorpha	MEPO5	U	P, U	U	U	.	P	.	.
.	.	.	.	7792	lehua papa	Metrosideros	rugosa	MERU2	U	P, U	U	U	.	P	.	.
.	.	.	.	7794	lehua ahihi	Metrosideros	tremuloides	METR5	U	P, U	U	U	.	P	.	.
.	.	.	.	7795	Kauai bottlebrush	Metrosideros	waialealae	MEWA	U	P, U	U	U	.	P	.	.
.	.	.	.	7798	ivory-nut palm	Metroxylon	amicarum	MEAM4	U	P, U	U	U	.	P	.	.
.	.	.	.	7799	sago palm	Metroxylon	sagu	MESA7	U	P, U	U	U	.	P	.	.
.	.	.	.	7801	Orange Champak	Michelia	champaca	MICH4	U	P, U	U	U	.	P	.	.
.	.	.	.	7804	saquiyac	Miconia	affinis	MIAF	U	U	U	C, U	C	.	.	.
.	.	.	.	7805	velvet tree	Miconia	calvescens	MICA20	U	P, U	U	U	.	P	.	.
.	.	.	.	7806	Puerto Rico johnnyberry	Miconia	foveolata	MIFO	U	U	U	C, U	C	.	.	.
.	.	.	.	7807	camasey de costilla	Miconia	impetiolaris	MIIM	U	U	U	C, U	C	.	.	.
.	.	.	.	7808	smooth johnnyberry	Miconia	laevigata	MILA8	U	U	U	C, U	C	.	.	.
.	.	.	.	7803	hairy johnnyberry	Miconia	lanata	MILA10	U	U	U	C, U	C	.	.	.
.	.	.	.	7810	camasey cuatrocanales	Miconia	mirabilis	MIMI3	U	U	U	C, U	C	.	.	.
.	.	.	.	7812	camasey racimoso	Miconia	pachyphylla	MIPA7	U	U	U	C, U	C	.	.	.
.	.	.	.	7813	granadillo bobo	Miconia	prasina	MIPR3	U	U	U	C, U	C	.	.	.
.	.	.	.	7814	auquey	Miconia	punctata	MIPU9	U	U	U	C, U	C	.	.	.
.	.	.	.	7815	ridge johnnyberry	Miconia	pycnoneura	MIPY2	U	U	U	C, U	C	.	.	.
.	.	.	.	7816	camasey felpa	Miconia	racemosa	MIRA2	U	U	U	C, U	C	.	.	.
.	.	.	.	7817	peralejo	Miconia	rubiginosa	MIRU4	U	U	U	C, U	C	.	.	.
.	.	.	.	7818	jau jau	Miconia	serrulata	MISE2	U	U	U	C, U	C	.	.	.
.	.	.	.	7819	mountain johnnyberry	Miconia	sintenisii	MISI2	U	U	U	C, U	C	.	.	.
.	.	.	.	7821	forest johnnyberry	Miconia	subcorymbosa	MISU3	U	U	U	C, U	C	.	.	.
.	.	.	.	7822	rajador	Miconia	tetrandra	MITE4	U	U	U	C, U	C	.	.	.
.	.	.	.	7823	camasey tomaso	Miconia	thomasiana	MITH	U	U	U	C, U	C	.	.	.
.	.	.	.	7824	talafulu	Micromelum	minutum	MIMI23	U	P, U	U	U	.	P	.	.
.	.	.	.	7828	caimitillo verde	Micropholis	garciniifolia	MIGA	U	U	U	C, U	C	.	.	.
.	.	.	.	7829	Micropholis guyanensis	Micropholis	guyanensis	MIGU2	U	U	U	C, U	C	.	.	.

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.	.	.	.	7831	pinnata	Millettia	pinnata	MIPI9	U	P, U	U	U	.	P	.	.
.	.	.	.	7833	elegant mimosa	Mimosa	arenosa	MIAR4	U	U	U	C, U	C	.	.	.
.	.	.	.	7835	bulletwood, elengi	Mimusops	elengi	MIEL4	U	P, U	U	U	.	P	.	.
.	.	.	.	7839	monodora	Monodora	spp.	MONOD	U	U	U	C, U	C	.	.	.
.	.	.	.	7841	treedaisy	Montanoa	hibiscifolia	MOHI	U	P, U	U	U	.	P	.	.
.	.	.	.	7845	Morella cerifera	Morella	cerifera	MOCE2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7846	firetree	Morella	faya	MOFA	U	P, U	U	U	.	P	.	.
.	.	.	.	7847	Morella holdridgeana	Morella	holdridgeana	MOHO3	U	U	U	C, U	C	.	.	.
.	.	.	.	7849	Indian mulberry	Morinda	citrifolia	MOCI3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7850	ngel	Morinda	latibractea	MOLA12	U	P, U	U	U	.	P	.	.
.	.	.	.	7851	Morinda pedunculata	Morinda	pedunculata	MOPE2	U	P, U	U	U	.	P	.	.
.	.	.	.	7853	noni kuahiwi	Morinda	trimera	MOTR	U	P, U	U	U	.	P	.	.
.	.	.	.	7855	horseradishtree	Moringa	oleifera	MOOL	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7857	ratapple	Morisonia	americana	MOAM	U	U	U	C, U	C	.	.	.
.	.	.	.	681	white mulberry	Morus	alba	MOAL	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	683	Texas mulberry	Morus	microphylla	MOMI	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	684	black mulberry	Morus	nigra	MONI	R, U	PNWS, U	R, U	R, C, U	C	.	.	P2
.	.	.	.	682	red mulberry	Morus	rubra	MORU2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7862	murta	Mouriri	domingensis	MODO2	U	U	U	C, U	C	.	.	.
.	.	.	.	7863	mameyuelo	Mouriri	helleri	MOHE	U	U	U	C, U	C	.	.	.
.	.	.	.	7865	falseohe	Munroidendron	racemosum	MURA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7867	strawberrytree	Muntingia	calabura	MUCA4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7869	Murraya exotica	Murraya	exotica	MUEX2	U	U	U	C, U	C	.	.	.
.	.	.	.	7870	Murraya koenigii	Murraya	koenigii	MUKO	U	P, U	U	U	.	P	.	.
.	.	.	.	7881	aloalo vao	Mussaenda	raiateensis	MURA5	U	P, U	U	U	.	P	.	.
.	.	.	.	7861	ngaio tree	Myoporum	laetum	MYLA5	U	U	U	U	.	.	U	.
.	.	.	.	7883	naio	Myoporum	sandwicense	MYSA	U	P, U	U	U	.	P	.	.
.	.	.	.	7886	red rodwood	Myrcia	citrifolia	MYCI	U	U	U	C, U	C	.	.	.
.	.	.	.	7887	cieneguillo	Myrcia	deflexa	MYDE	U	U	U	C, U	C	.	.	.
.	.	.	.	7888	curame	Myrcia	fallax	MYFA3	U	U	U	C, U	C	.	.	.
.	.	.	.	7889	guayabacon	Myrcia	leptoclada	MYLE	U	U	U	C, U	C	.	.	.
.	.	.	.	7890	ausu	Myrcia	paganii	MYPA	U	U	U	C, U	C	.	.	.
.	.	.	.	7891	punchberry	Myrcia	splendens	MYSP	U	U	U	C, U	C	.	.	.
.	.	.	.	7893	twinberry	Myrcianthes	fragrans	MYFR	U	U	U	C, U	C	.	.	.
.	.	.	.	7894	jaboticaba	Myrciaria	cauliflora	MYCA9	U	P, U	U	U	.	P	.	.
.	.	.	.	7895	guavaberry	Myrciaria	floribunda	MYFL	U	U	U	C, U	C	.	.	.
.	.	.	.	7899	yamamomo, strawberry tree	Myrica	rubra	MYRU3	U	P, U	U	U	.	P	.	.
.	.	.	.	7902	atoneulu	Myristica	hypargyraea	MYHY2	U	P, U	U	U	.	P	.	.

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.	.	.	.	7903	adepurot	Myristica	insularis	MYIN3	U	P, U	U	U	.	P	.	.
.	.	.	.	7906	Myristica inutilis	Myristica	inutilis	MYIN4	U	P, U	U	U	.	P	.	.
.	.	.	.	7905	cercipo	Myrospermum	frutescens	MYFR2	U	U	U	C, U	C	.	.	.
.	.	.	.	7907	balsam of Tolu	Myroxylon	balsamum	MYBA3	U	U	U	C, U	C	.	.	.
.	.	.	.	7910	forest colicwood	Myrsine	alyxifolia	MYAL4	U	P, U	U	U	.	P	.	.
.	.	.	.	7911	leathery colicwood	Myrsine	coriacea	MYCO2	U	U	U	C, U	C	.	.	.
.	.	.	.	7912	Myrsine cubana	Myrsine	cubana	MYCU2	U	U	U	C, U	C	.	.	.
.	.	.	.	7913	summit colicwood	Myrsine	degeneri	MYDE2	U	P, U	U	U	.	P	.	.
.	.	.	.	7914	mountain colicwood	Myrsine	emarginata	MYEM	U	P, U	U	U	.	P	.	.
.	.	.	.	7915	streambank colicwood	Myrsine	fernseei	MYFE	U	P, U	U	U	.	P	.	.
.	.	.	.	7916	Koolau Range colicwood	Myrsine	fosbergii	MYFO	U	P, U	U	U	.	P	.	.
.	.	.	.	7918	Wahiawa Bog colicwood	Myrsine	helleri	MYHE3	U	P, U	U	U	.	P	.	.
.	.	.	.	7919	Kauai colicwood	Myrsine	kauaiensis	MYKA	U	P, U	U	U	.	P	.	.
.	.	.	.	7920	Kokee colicwood	Myrsine	knudsenii	MYKN	U	P, U	U	U	.	P	.	.
.	.	.	.	7921	Lanai colicwood	Myrsine	lanaiensis	MYLA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7922	kolea lau nui	Myrsine	lessertiana	MYLE2	U	P, U	U	U	.	P	.	.
.	.	.	.	7923	Hanapepe River colicwood	Myrsine	mezii	MYME2	U	P, U	U	U	.	P	.	.
.	.	.	.	7929	Myrsine palauensis	Myrsine	palauensis	MYPA7	U	P, U	U	U	.	P	.	.
.	.	.	.	7924	swamp colicwood	Myrsine	petiolata	MYPE3	U	P, U	U	U	.	P	.	.
.	.	.	.	7925	Molokai colicwood	Myrsine	pukooensis	MYPU2	U	P, U	U	U	.	P	.	.
.	.	.	.	7926	kokea lau lii	Myrsine	sandwicensis	MYSA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7928	Mt. Kahili colicwood	Myrsine	wawraea	MYWA	U	P, U	U	U	.	P	.	.
.	.	.	.	7932	Nectandra coriacea	Nectandra	coriacea	NECO	U	U	U	C, U	C	.	.	.
.	.	.	.	7933	shinglewood	Nectandra	hihua	NEHI2	U	U	U	C, U	C	.	.	.
.	.	.	.	7934	Nectandra krugii	Nectandra	krugii	NEKR	U	U	U	C, U	C	.	.	.
.	.	.	.	7935	Nectandra membranacea	Nectandra	membranacea	NEME3	U	U	U	C, U	C	.	.	.
.	.	.	.	7936	Nectandra patens	Nectandra	patens	NEPA4	U	U	U	C, U	C	.	.	.
.	.	.	.	7939	Nectandra turbacensis	Nectandra	turbacensis	NETU	U	U	U	C, U	C	.	.	.
.	.	.	.	7940	saltwood	Neea	buxifolia	NEBU	U	U	U	C, U	C	.	.	.
.	.	.	.	7944	kadam	Neolamarckia	cadamba	NECA7	U	U	U	C, U	C	.	.	.
.	.	.	.	7946	aquilon	Neolaugeria	resinosa	NERE2	U	U	U	C, U	C	.	.	.
.	.	.	.	7948	afa	Neonauclea	forsteri	NEFO2	U	P, U	U	U	.	P	.	.
.	.	.	.	7952	Rambutan	Nephelium	lappaceum	NELA7	U	P, U	U	U	.	P	.	.
.	.	.	.	7953	pulasan	Nephelium	ramboutan-ake	NERA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7954	maaloa	Neraudia	melastomifolia	NEME5	U	P, U	U	U	.	P	.	.
.	.	.	.	7958	keahi	Nesoluma	polynesicum	NEPO	U	P, U	U	U	.	P	.	.
.	.	.	.	7960	Hawaii olive	Nestegis	sandwicensis	NESA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7962	kalm, aralm	Neuburgia	celebica	NECE	U	P, U	U	U	.	P	.	.

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.	.	.	.	7964	tree tobacco	Nicotiana	glauca	NIGL	U	P, U	U	U	.	P	U	.
.	.	.	.	7966	smallflower aiea	Nothocestrum	breviflorum	NOBR2	U	P, U	U	U	.	P	.	.
.	.	.	.	7967	broadleaf aiea	Nothocestrum	latifolium	NOLA	U	P, U	U	U	.	P	.	.
.	.	.	.	7968	longleaf aiea	Nothocestrum	longifolium	NOLO	U	P, U	U	U	.	P	.	.
.	.	.	.	7969	Oahu aiea	Nothocestrum	peltatum	NOPE	U	P, U	U	U	.	P	.	.
.	.	.	.	7971	kaala rockwort	Nototrichium	humile	NOHU	U	P, U	U	U	.	P	.	.
.	.	.	.	7972	Hawaii rockwort	Nototrichium	sandwicense	NOSA	U	P, U	U	U	.	P	.	.
.	.	.	.	691	water tupelo	Nyssa	aquatica	NYAQ2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	694	swamp tupelo	Nyssa	biflora	NYBI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	692	Ogeechee tupelo	Nyssa	ogeche	NYOG	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	693	blackgum	Nyssa	sylvatica	NYSY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	7976	African bird's-eye bush	Ochna	mossambicensis	OCMO4	U	U	U	C, U	C	.	.	.
.	.	.	.	7978	Thomas birds-eye bush	Ochna	thomasiana	OCTH	U	P, U	U	U	.	P	.	.
.	.	.	.	7980	Ochroma pyramidale	Ochroma	pyramidale	OCPY	U	P, U	U	C, U	C	P	.	.
.	.	.	.	7982	holei	Ochrosia	compta	OCCO	U	P, U	U	U	.	P	.	.
.	.	.	.	7983	island yellowwood	Ochrosia	haleakalae	OCHA	U	P, U	U	U	.	P	.	.
.	.	.	.	7984	Kauai yellowwood	Ochrosia	kauaiensis	OCKA	U	P, U	U	U	.	P	.	.
.	.	.	.	7985	Hawaii yellowwood	Ochrosia	kilaueaensis	OCKI	U	P, U	U	U	.	P	.	.
.	.	.	.	7987	langiti	Ochrosia	mariannensis	OCMA2	U	P, U	U	U	.	P	.	.
.	.	.	.	7942	fao	Ochrosia	oppositifolia	OCOP	U	P, U	U	U	.	P	.	.
.	.	.	.	7990	laurel espada	Ocotea	floribunda	OCFL	U	U	U	C, U	C	.	.	.
.	.	.	.	7991	black sweetwood	Ocotea	foeniculacea	OCFO	U	U	U	C, U	C	.	.	.
.	.	.	.	7994	loblolly sweetwood	Ocotea	leucoxylon	OCLE	U	U	U	C, U	C	.	.	.
.	.	.	.	7996	nemoca	Ocotea	moschata	OCMO	U	U	U	C, U	C	.	.	.
.	.	.	.	7997	laurel sassafras	Ocotea	nemodaphne	OCNE	U	U	U	C, U	C	.	.	.
.	.	.	.	7999	laurel de paloma	Ocotea	portoricensis	OCPO	U	U	U	C, U	C	.	.	.
.	.	.	.	8001	nemoca cimarrona	Ocotea	spathulata	OCSP	U	U	U	C, U	C	.	.	.
.	.	.	.	8003	Wright's laurel canelon	Ocotea	wrightii	OCWR	U	U	U	C, U	C	.	.	.
.	.	.	.	8004	olive	Olea	europaea	OLEU	U	P, U	U	U	.	P	U	.
.	.	.	.	8019	amansis, edebsungelked, necklace bead tree	Ormosia	calavensis	ORCA12	U	P, U	U	U	.	P	.	.
.	.	.	.	8020	peronia	Ormosia	krugii	ORKR	U	U	U	C, U	C	.	.	.
.	.	.	.	8022	kesiamel	Osmoxylon	oliveri	OSOL	U	P, U	U	U	.	P	.	.
.	.	.	.	8023	kesiamel	Osmoxylon	pachyphyllum	OSPA	U	P, U	U	U	.	P	.	.
.	.	.	.	718	kesiamel	Osmoxylon	truncatum	OSTR	U	P, U	U	U	.	P	.	.
.	.	.	.	701	eastern hophornbeam	Ostrya	virginiana	OSVI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8027	pincho palo de rosa	Ottoschulzia	rhodoxylon	OTRH	U	U	U	C, U	C	.	.	.
.	.	.	.	8029	chicharron amarillo	Ouratea	ilicifolia	OUIL	U	U	U	C, U	C	.	.	.

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.	.	.	.	8030	abey amarillo	Ouratea	littoralis	OULI	U	U	U	C, U	C	.	.	.
.	.	.	.	8032	guanabanilla	Ouratea	striata	OUST	U	U	U	C, U	C	.	.	.
.	.	.	.	8033	blacklancewood	Oxandra	lanceolata	OXLA4	U	U	U	C, U	C	.	.	.
.	.	.	.	8034	haya	Oxandra	laurifolia	OXLA5	U	U	U	C, U	C	.	.	.
.	.	.	.	711	sourwood	Oxydendrum	arboreum	OXAR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8036	miich era ngebard, guiana chestnut	Pachira	aquatica	PAAQ2	U	P, U	U	U	.	P	.	.
.	.	.	.	8037	wild chestnut	Pachira	insignis	PAIN7	U	U	U	C, U	C	.	.	.
.	.	.	.	8074	Palaquium karrak	Palaquium	karrak	PAKA	U	P, U	U	U	.	P	.	.
.	.	.	.	8044	gasu	Palaquium	stehlinii	PAST24	U	P, U	U	U	.	P	.	.
.	.	.	.	8045	tafetan	Palicourea	alpina	PAAL9	U	U	U	C, U	C	.	.	.
.	.	.	.	8047	red cappel	Palicourea	crocea	PACR3	U	U	U	C, U	C	.	.	.
.	.	.	.	8049	Palicourea croceoides	Palicourea	croceoides	PACR18	U	U	U	C, U	C	.	.	.
.	.	.	.	8051	showy cappel	Palicourea	guianensis	PAGU	U	U	U	C, U	C	.	.	.
.	.	.	.	8054	chertochet	Pandanus	aimiriikensis	PAAI	U	P, U	U	U	.	P	.	.
.	.	.	.	8055	matal	Pandanus	cominsii	PACO51	U	P, U	U	U	.	P	.	.
.	.	.	.	8060	pahong	Pandanus	dubius	PADU3	U	P, U	U	U	.	P	.	.
.	.	.	.	8053	Pandanus japensis	Pandanus	japensis	PAJA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8067	buuk	Pandanus	kanehirae	PAKA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8072	ongor, ertochet	Pandanus	macrojeanneretia	PAMA32	U	P, U	U	U	.	P	.	.
.	.	.	.	8076	ongor, ertochet	Pandanus	palawensis	PAPA38	U	P, U	U	U	.	P	.	.
.	.	.	.	8077	peet	Pandanus	patina	PAPA39	U	P, U	U	U	.	P	.	.
.	.	.	.	8078	ongor	Pandanus	peliliuensis	PAPE	U	P, U	U	U	.	P	.	.
.	.	.	.	8082	fasa	Pandanus	reineckei	PARE19	U	P, U	U	U	.	P	.	.
.	.	.	.	8084	screwpine	Pandanus	spp.	PANDA	U	P, U	U	U	.	P	.	.
.	.	.	.	8085	Tahitian screwpine	Pandanus	tectorius	PATE2	U	P, U	U	U	.	P	.	.
.	.	.	.	8088	common screwpine	Pandanus	utilis	PAUT	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8091	rauel	Pangium	edule	PAED4	U	P, U	U	U	.	P	.	.
.	.	.	.	8099	scratchthroat	Parathesis	crenulata	PACR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8103	sea	Parinari	insularum	PAIN20	U	P, U	U	U	.	P	.	.
.	.	.	.	8104	ais	Parinari	laurina	PALA5	U	P, U	U	U	.	P	.	.
.	.	.	.	8107	Parkia korom	Parkia	korom	PAKO5	U	P, U	U	U	.	P	.	.
.	.	.	.	8108	kmekumer	Parkia	parvifoliola	PAPA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8106	parkia	Parkia	spp.	PARKI3	U	U	U	C, U	C	.	.	.
.	.	.	.	8110	Parkia timoriana	Parkia	timoriana	PATI5	U	U	U	C, U	C	.	.	.
.	3	.	.	8111	Jerusalem thorn	Parkinsonia	aculeata	PAAC3	U	P, U	U	C, U	C	P	.	.
NUE	.	.	.	8112	paloverde	Parkinsonia	spp.	PARKI2	U	P, U	U	U	.	P	.	.
.	.	.	.	8115	Texas paloverde	Parkinsonia	texana	PATE10	U	U	U	U	.	.	U	.
.	.	.	.	8113	cuachilote	Parmentiera	aculeata	PAAC13	U	U	U	C, U	C	.	.	.
.	.	.	.	8114	candle tree	Parmentiera	cereifera	PACE8	U	U	U	C, U	C	.	.	.
.	.	.	.	712	paulownia, empress-tree	Paulownia	tomentosa	PATO2	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2

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.	.	.	.	8121	Peltophorum pterocarpum	Peltophorum	pterocarpum	PEPT3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8123	ngis	Pemphis	acidula	PEAC6	U	P, U	U	U	.	P	.	.
.	.	.	.	8125	butter tree	Pentadesma	butyracea	PEBU4	U	U	U	C, U	C	.	.	.
.	.	.	.	8127	jiqi	Pera	bumeliifolia	PEBU2	U	U	U	C, U	C	.	.	.
.	.	.	.	8129	Pericopsis mooniana	Pericopsis	mooniana	PEMO13	U	P, U	U	U	.	P	.	.
.	.	.	.	8131	olomea	Perrottetia	sandwicensis	PESA3	U	P, U	U	U	.	P	.	.
.	.	.	.	7211	avocado	Persea	americana	PEAM3	R, U	P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	721	redbay	Persea	borbonia	PEBO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8134	canela	Persea	krugii	PEKR	U	U	U	C, U	C	.	.	.
.	.	.	.	6511	swamp bay	Persea	palustris	PEPA37	U	U	U	U	.	.	U	.
.	.	.	.	8138	aquacatillo	Persea	urbaniana	PEUR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8141	bastard stopper	Petitia	domingensis	PEDO	U	U	U	C, U	C	.	.	.
.	.	.	.	8146	Phaleria nisidai	Phaleria	nisidai	PHNI11	U	P, U	U	U	.	P	.	.
.	.	.	.	6516	Amur corktree	Phellodendron	amurense	PHAM2	U	U	U	U	.	.	U	.
.	.	.	.	8143	aquilon prieto	Phialanthus	grandifolius	PHGR11	U	U	U	C, U	C	.	.	.
.	.	.	.	8144	candlewood	Phialanthus	myrtilloides	PHMY	U	U	U	C, U	C	.	.	.
.	.	.	.	8151	Canary Island date palm	Phoenix	canariensis	PHCA13	U	P, U	U	U	.	P	.	.
.	.	.	.	8152	date palm	Phoenix	dactylifera	PHDA4	U	P, U	U	U	.	P	U	.
.	.	.	.	8150	pygmy date palm	Phoenix	roebelenii	PHRO6	U	U	U	U	.	.	U	.
.	.	.	.	8154	date palm	Phoenix	sylvestris	PHSY3	U	P, U	U	U	.	P	.	.
.	.	.	.	8155	Chinese photinia	Photinia	davidiana	PHDA5	U	P, U	U	U	.	P	.	.
.	.	.	.	8157	Tahitian gooseberry tree	Phyllanthus	acidus	PHAC3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8159	pamakani mahu	Phyllanthus	distichus	PHDI10	U	P, U	U	U	.	P	.	.
.	.	.	.	8160	gamo de costa	Phyllanthus	juglandifolius	PHJU2	U	U	U	C, U	C	.	.	.
.	.	.	.	8162	Phyllanthus orbicularis	Phyllanthus	orbicularis	PHOR10	U	U	U	C, U	C	.	.	.
.	.	.	.	8164	Florida bitterbush	Picramnia	pentandra	PIPE	U	U	U	C, U	C	.	.	.
.	.	.	.	8167	bitterwood	Picrasma	excelsa	PIEX	U	U	U	C, U	C	.	.	.
.	.	.	.	8169	fustic	Pictetia	aculeata	PIAC	U	U	U	C, U	C	.	.	.
.	.	.	.	8171	aceitillo	Pilocarpus	racemosus	PIRA3	U	U	U	C, U	C	.	.	.
.	.	.	.	8173	Royen's tree cactus	Pilosocereus	royenii	PIRO6	U	U	U	C, U	C	.	.	.
.	.	.	.	8175	allspice	Pimenta	dioica	PIDI2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8177	bayrumtree	Pimenta	racemosa	PIRA	U	U	U	C, U	C	.	.	.
.	.	.	.	8178	bayrumtree	Pimenta	racemosa var. grisea	PIRAG	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8181	chebouch, demailei	Pinanga	insignis	PIIN5	U	P, U	U	U	.	P	.	.
.	.	.	.	8190	higuillo de hoja menuda	Piper	aduncum	PIAD	U	U	U	C, U	C	.	.	.
.	.	.	.	8191	higuillo de limon	Piper	amalago	PIAM2	U	U	U	C, U	C	.	.	.

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.	.	.	.	8192	moth pepper	Piper	blattarum	PIBL	U	U	U	C, U	C	.	.	.
.	.	.	.	8196	marigold pepper	Piper	marginatum	PIMA4	U	U	U	C, U	C	.	.	.
.	.	.	.	8199	spanish elder	Piper	swartzianum	PISW	U	U	U	C, U	C	.	.	.
.	.	.	.	8205	Waimea pipturus	Pipturus	albidus	PIAL2	U	P, U	U	U	.	P	.	.
.	.	.	.	8206	soga	Pipturus	argenteus	PIAR8	U	P, U	U	U	.	P	.	.
.	.	.	.	8208	stinkwood	Piscidia	carthagenensis	PICA5	U	U	U	C, U	C	.	.	.
.	.	.	.	887	fishpoison tree	Piscidia	piscipula	PIPI3	R, U	P, U	U	R, U	.	P	.	P2
.	.	.	.	8211	corcho bobo	Pisonia	albida	PIAL3	U	U	U	C, U	C	.	.	.
.	.	.	.	8212	Australasian catchbirdtree	Pisonia	brunoniana	PIBR3	U	P, U	U	U	.	P	.	.
.	.	.	.	8213	grand devils-claws	Pisonia	grandis	PIGR6	U	P, U	U	U	.	P	.	.
.	.	.	.	8214	aulu	Pisonia	sandwicensis	PISA5	U	P, U	U	U	.	P	.	.
.	.	.	.	8216	water mampoo	Pisonia	subcordata	PISU	U	U	U	C, U	C	.	.	.
.	.	.	.	8217	umbrella catchbirdtree	Pisonia	umbellifera	PIUM2	U	P, U	U	U	.	P	.	.
.	.	.	.	8218	Kauai catchbirdtree	Pisonia	wagneriana	PIWA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8219	Chinese pistache	Pistacia	chinensis	PICH4	U	U	U	U	.	.	U	.
.	.	.	.	8220	monkeypod	Pithecellobium	dulce	PIDU	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8223	catclaw blackbead	Pithecellobium	unguis-cati	PIUN	U	U	U	C, U	C	.	.	.
.	.	.	.	8226	Hawaii poisonberry tree	Pittosporum	argentifolium	PIAR4	U	P, U	U	U	.	P	.	.
.	.	.	.	8227	hoawa	Pittosporum	confertiflorum	PICO4	U	P, U	U	U	.	P	.	.
.	.	.	.	8225	kamal	Pittosporum	ferrugineum	PIFE3	U	P, U	U	U	.	P	.	.
.	.	.	.	8228	Waianae Range cheesewood	Pittosporum	flocculosum	PIFL4	U	P, U	U	U	.	P	.	.
.	.	.	.	8229	Waialeale cheesewood	Pittosporum	gayanum	PIGA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8230	Koolau Range cheesewood	Pittosporum	glabrum	PIGL4	U	P, U	U	U	.	P	.	.
.	.	.	.	8231	hoawa	Pittosporum	halophilum	PIHA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8232	Hawaii cheesewood	Pittosporum	hawaiiense	PIHA4	U	P, U	U	U	.	P	.	.
.	.	.	.	8233	Kona cheesewood	Pittosporum	hosmeri	PIHO	U	P, U	U	U	.	P	.	.
.	.	.	.	8234	Kauai cheesewood	Pittosporum	kauaiense	PIKA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8224	Mona cheesewood, Pittosporum	Pittosporum	monae	PIMO4	U	P, U	U	U	.	P	.	.
.	.	.	.	8235	royal cheesewood	Pittosporum	napaliense	PINA	U	P, U	U	U	.	P	.	.
.	.	.	.	8236	Taiwanese cheesewood	Pittosporum	pentandrum	PIPE8	U	P, U	U	U	.	P	.	.
.	.	.	.	8238	cheesewood	Pittosporum	spp.	PITTO	U	P, U	U	U	.	P	.	.
.	.	.	.	8239	cream cheesewood	Pittosporum	terminalioides	PITE5	U	P, U	U	U	.	P	.	.
.	.	.	.	8222	Japanese cheesewood	Pittosporum	tobira	PITO2	U	U	U	U	.	.	U	.
.	.	.	.	8240	Australian cheesewood	Pittosporum	undulatum	PIUN2	U	P, U	U	U	.	P	.	.
.	.	.	.	8241	cape cheesewood	Pittosporum	viridiflorum	PIVI5	U	P, U	U	U	.	P	.	.

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.	.	.	.	8242	alaa	Planchonella	garberi	PLGA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8243	alaa	Planchonella	grayana	PLGR11	U	P, U	U	U	.	P	.	.
.	.	.	.	8244	alaa	Planchonella	linggensis	PLLI6	U	P, U	U	U	.	P	.	.
.	.	.	.	8303	lalahag	Planchonella	obovata	PLOB5	U	P, U	U	U	.	P	.	.
.	.	.	.	8248	mamalava	Planchonella	torricellensis	PLTO2	U	P, U	U	U	.	P	.	.
.	.	.	.	722	water-elm, planertree	Planera	aquatica	PLAQ	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8253	London planetree	Platanus	hybrida	PLHY3	U	U	U	U	.	.	U	.
.	.	.	.	8256	Mexican sycamore	Platanus	mexicana	PLME9	U	U	U	U	.	.	U	.
.	.	.	.	731	American sycamore	Platanus	occidentalis	PLOC	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8254	Oriental planetree	Platanus	orientalis	PLOR6	U	U	U	U	.	.	U	.
.	.	.	.	730	California sycamore	Platanus	racemosa	PLRA	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	732	Arizona sycamore	Platanus	wrightii	PLWR2	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8250	Hawaii pilo kea	Platydesma	remyi	PLRE4	U	P, U	U	U	.	P	.	.
.	.	.	.	8251	Maui pilo kea	Platydesma	spathulata	PLSP3	U	P, U	U	U	.	P	.	.
.	.	.	.	8255	chupa gallo	Pleodendron	macranthum	PLMA6	U	U	U	C, U	C	.	.	.
.	.	.	.	8257	golden hala pepe	Pleomele	aurea	PLAU2	U	P, U	U	U	.	P	.	.
.	.	.	.	8258	Maui hala pepe	Pleomele	auwahiensis	PLAU5	U	P, U	U	U	.	P	.	.
.	.	.	.	8259	Lanai hala pepe	Pleomele	fernaldii	PLFE	U	P, U	U	U	.	P	.	.
.	.	.	.	8260	Waianae Range hala pepe	Pleomele	forbesii	PLFO2	U	P, U	U	U	.	P	.	.
.	.	.	.	8261	royal hala pepe	Pleomele	halapepe	PLHA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8262	Hawaii hala pepe	Pleomele	hawaiiensis	PLHA4	U	P, U	U	U	.	P	.	.
.	.	.	.	8266	nosegaytree	Plumeria	alba	PLAL	U	U	U	C, U	C	.	.	.
.	.	.	.	8268	Singapore graveyard flower	Plumeria	obtusa	PLOB2	U	U	U	C, U	C	.	.	.
.	.	.	.	8269	Plumeria obtusa	Plumeria	obtusa var. obtusa	PLOBO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8271	templetree	Plumeria	rubra	PLRU2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8273	yucca plum pine	Podocarpus	coriaceus	POCO3	U	U	U	C, U	C	.	.	.
.	.	.	.	8275	Poitea florida	Poitea	florida	POFL20	U	U	U	C, U	C	.	.	.
.	.	.	.	8279	violet tree	Polygala	cowellii	POCO5	U	U	U	C, U	C	.	.	.
.	.	.	.	8280	crevajosa	Polygala	penaea	POPE13	U	U	U	C, U	C	.	.	.
.	.	.	.	8283	bungaruau	Polyscias	grandifolia	POGR28	U	P, U	U	U	.	P	.	.
.	.	.	.	8284	panax, geranium aralia	Polyscias	guilfoylei	POGU	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8285	Polyscias macgillivrayi	Polyscias	macgillivrayi	POMA	U	P, U	U	U	.	P	.	.
.	.	.	.	8286	bngei	Polyscias	nodosa	PONO10	U	P, U	U	U	.	P	.	.
.	.	.	.	8287	tagitagi	Polyscias	samoensis	POSA27	U	P, U	U	U	.	P	.	.
.	.	.	.	8288	shield aralia	Polyscias	scutellaria	POSC10	U	P, U	U	U	.	P	.	.
.	.	.	.	8289	Polyscias	Polyscias	spp.	POLYS4	U	P, U	U	U	.	P	.	.
.	.	.	.	8290	tava	Pometia	pinnata	POPI12	U	P, U	U	U	.	P	.	.
.	.	.	.	8292	kattai	Ponapea	hosinoi	POHO	U	P, U	U	U	.	P	.	.

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.	.	.	.	8293	Ponapea ledermanniana	Ponapea	ledermanniana	POLE21	U	P, U	U	U	.	P	.	.
.	.	.	.	8296	hardy orange	Poncirus	trifoliata	POTR4	U	U	U	U	.	.	U	.
.	.	.	.	8295	kisaks	Pongamia	pinnata	POPI4	U	P, U	U	U	.	P	.	.
.	.	.	.	752	silver poplar	Populus	alba	POAL7	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	749	narrowleaf cottonwood	Populus	angustifolia	POAN3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	741	balsam poplar	Populus	balsamifera	POBA2	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
.	.	.	.	747	black cottonwood	Populus	balsamifera ssp. trichocarpa	POBAT	R, U	PNWS, AK, U	R, U	U	.	.	.	P2
.	.	.	.	742	eastern cottonwood	Populus	deltoides	PODE3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	748	Fremont cottonwood	Populus	fremontii	POFR2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	743	bigtooth aspen	Populus	grandidentata	POGR4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	744	swamp cottonwood	Populus	heterophylla	POHE4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	753	Lombardy poplar	Populus	nigra	PONI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	746	quaking aspen	Populus	tremuloides	POTR5	R, U	PNWS, AK, U	R, U	R, U	.	.	.	P2
.	.	.	.	8313	Carolina poplar	Populus	x canadensis	POCA19	U	U	U	U	.	.	U	.
.	.	.	.	8314	gray poplar	Populus	x canescens	POCA14	U	U	U	U	.	.	U	.
.	.	.	.	8297	Abiu	Pouteria	caimito	POCA43	U	P, U	U	U	.	P	.	.
.	.	.	.	8298	elangel, chelangel	Pouteria	calcarea	POCA6	U	P, U	U	U	.	P	.	.
.	.	.	.	8299	eggfruit	Pouteria	campechiana	POCA23	U	P, U	U	U	.	P	.	.
.	.	.	.	8300	cocuyo	Pouteria	dictyoneura	PODI5	U	U	U	C, U	C	.	.	.
.	.	.	.	8301	redmammee	Pouteria	hotteana	POHO4	U	U	U	C, U	C	.	.	.
.	.	.	.	8302	bullytree	Pouteria	multiflora	POMU6	U	U	U	C, U	C	.	.	.
.	.	.	.	8304	alaa	Pouteria	sandwicensis	POSA11	U	P, U	U	U	.	P	.	.
.	.	.	.	8305	mammee sapote	Pouteria	sapota	POSA13	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8307	ahgao	Premna	obtusifolia	PROB	U	P, U	U	U	.	P	.	.
.	.	.	.	8308	Premna pubescens	Premna	pubescens	PRPU5	U	P, U	U	U	.	P	.	.
.	.	.	.	8309	aloalo	Premna	serratifolia	PRSE6	U	P, U	U	U	.	P	.	.
.	.	.	.	8311	Prestoea acuminata	Prestoea	acuminata	PRACM	U	U	U	C, U	C	.	.	.
.	.	.	.	8315	Hawaii pritchardia	Pritchardia	affinis	PRAF	U	P, U	U	U	.	P	.	.
.	.	.	.	8316	Maui pritchardia	Pritchardia	arecina	PRAR2	U	P, U	U	U	.	P	.	.
.	.	.	.	8317	Kilauea pritchardia	Pritchardia	beccariana	PRBE	U	P, U	U	U	.	P	.	.
.	.	.	.	8318	Mt. Eke pritchardia	Pritchardia	forbesiana	PRFO	U	P, U	U	U	.	P	.	.
.	.	.	.	8319	Makaleha pritchardia	Pritchardia	hardyi	PRHA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8320	loulu lelo	Pritchardia	hillebrandii	PRHI	U	P, U	U	U	.	P	.	.
.	.	.	.	8321	Waianae Range pritchardia	Pritchardia	kaalae	PRKA	U	P, U	U	U	.	P	.	.
.	.	.	.	8322	Lanai pritchardia	Pritchardia	lanaiensis	PRLA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8323	loulu	Pritchardia	lanigera	PRLA4	U	P, U	U	U	.	P	.	.

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.	.	.	.	8324	Limahuli Valley pritchardia	Pritchardia	limahuliensis	PRLI2	U	P, U	U	U	.	P	.	.
.	.	.	.	8325	Molokai pritchardia	Pritchardia	lowreyana	PRLO2	U	P, U	U	U	.	P	.	.
.	.	.	.	8326	Koolau Range pritchardia	Pritchardia	martii	PRMA5	U	P, U	U	U	.	P	.	.
.	.	.	.	8327	Alakai Swamp pritchardia	Pritchardia	minor	PRMI3	U	P, U	U	U	.	P	.	.
.	.	.	.	8328	Kamalo pritchardia	Pritchardia	munroi	PRMU3	U	P, U	U	U	.	P	.	.
.	.	.	.	8329	fan palm	Pritchardia	pacifica	PRPA11	U	P, U	U	U	.	P	.	.
.	.	.	.	8330	Waioli Valley pritchardia	Pritchardia	perlmanii	PRPE7	U	P, U	U	U	.	P	.	.
.	.	.	.	8331	Nihoa pritchardia	Pritchardia	remota	PRRE	U	P, U	U	U	.	P	.	.
.	.	.	.	8336	lands of papa pritchardia	Pritchardia	schattaueri	PRSC	U	P, U	U	U	.	P	.	.
.	.	.	.	8337	pritchardia	Pritchardia	spp.	PRITC	U	P, U	U	U	.	P	.	.
.	.	.	.	8338	stickybud pritchardia	Pritchardia	viscosa	PRVI2	U	P, U	U	U	.	P	.	.
.	.	.	.	8339	poleline pritchardia	Pritchardia	waialealeana	PRWA	U	P, U	U	U	.	P	.	.
.	.	.	.	8340	guasimilla	Prockia	crucis	PRCR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8342	jand	Prosopis	cineraria	PRCI4	U	U	U	C, U	C	.	.	.
.	.	.	w	756	honey mesquite	Prosopis	glandulosa	PRGL2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8343	mesquite	Prosopis	juliflora	PRJU	U	P, U	U	U	.	P	.	.
.	.	.	.	8344	kiawe	Prosopis	pallida	PRPA4	U	P, U	U	C, U	C	P	.	.
.	.	.	w	758	screwbean mesquite	Prosopis	pubescens	PRPU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	757	velvet mesquite	Prosopis	velutina	PRVE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	769	Allegheny plum	Prunus	alleghaniensis	PRAL5	R, U	U	U	U	.	.	.	P2
.	.	.	.	766	American plum	Prunus	americana	PRAM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	770	Chickasaw plum	Prunus	angustifolia	PRAN3	R, U	U	U	U	.	.	.	P2
.	.	.	.	8350	apricot	Prunus	armeniaca	PRAR3	U	U	U	U	.	.	U	.
.	.	.	.	771	sweet cherry, domesticated	Prunus	avium	PRAV	R, U	PNWS, U	R, U	R, U	.	.	.	P2
NUE	.	.	.	8345	Carolina laurelcherry	Prunus	caroliniana	PRCA	.	U	U	U	.	.	U	.
.	.	.	.	8348	cherry plum	Prunus	cerasifera	PRCE2	U	U	U	U	.	.	U	.
NUE	.	.	.	772	sour cherry, domesticated	Prunus	cerasus	PRCE	R, U	U	U	U	.	.	.	P2
.	.	.	.	773	European plum, domesticated	Prunus	domestica	PRDO	R, U	U	U	U	.	.	.	P2
.	.	.	.	8351	sweet almond	Prunus	dulcis	PRDU	U	U	U	U	.	.	U	.
.	3, 4	.	.	768	bitter cherry	Prunus	emarginata	PREM	R, U	PNWS, U	.	U	.	.	.	P2
.	.	.	.	6696	cherry laurel	Prunus	laurocerasus	PRLA5	U	U	U	U	.	.	U	.
.	.	.	.	774	Mahaleb cherry, domesticated	Prunus	mahaleb	PRMA	R, U	U	U	U	.	.	.	P2

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.	.	.	.	6708	Mexican plum	Prunus	mexicana	PRME	.	.	.	.	.	.	.	.
.	.	.	.	8346	West Indian cherry	Prunus	myrtifolia	PRMY	U	U	U	C, U	C	.	.	.
.	.	.	.	765	Canada plum	Prunus	nigra	PRNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8347	western cherry laurel	Prunus	occidentalis	PROC	U	U	U	C, U	C	.	.	.
.	.	.	.	761	pin cherry	Prunus	pensylvanica	PRPE2	R, U	PNWS, U	.	R, U	.	.	.	P2
.	.	.	.	764	peach	Prunus	persica	PRPE3	R, U	P, U	U	R, U	.	P	.	P2
.	.	.	.	8360	Japanese plum	Prunus	salicina	PRSA3	U	U	U	U	.	.	U	.
.	.	.	.	762	black cherry	Prunus	serotina	PRSE2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8349	Prunus serotina	Prunus	serotine ssp. capuli	PRSEC	U	U	U	C, U	C	.	.	.
.	.	.	.	6707	Japanese flowering cherry	Prunus	serrulata	PRSE3	U	U	U	U	.	.	U	.
.	.	.	.	760	cherry and plum spp.	Prunus	spp.	PRUNU	R, U	U	U	R, C, U	C	.	.	P2
.	3, 4	.	.	763	chokecherry	Prunus	virginiana	PRVI	R, U	PNWS, U	.	R, U	.	.	.	P2
.	.	.	.	8357	Yoshino flowering cherry	Prunus	x yedoensis	PRYE	U	U	U	U	.	.	U	.
.	.	.	.	8352	false breadnut	Pseudolmedia	spuria	PSSP2	U	U	U	C, U	C	.	.	.
.	.	.	.	8353	Florida cherry palm	Pseudophoenix	sargentii	PSSA	U	U	U	C, U	C	.	.	.
.	.	.	.	8354	mountain guava	Psidium	amplexicaule	PSAM	U	U	U	C, U	C	.	.	.
.	.	.	.	8355	strawberry guava	Psidium	cattleianum	PSCA	U	P, U	U	U	.	P	.	.
.	.	.	.	8356	guava	Psidium	guajava	PSGU	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8358	Psidium longipes	Psidium	longipes	PSLOO	U	U	U	C, U	C	.	.	.
.	.	.	.	8359	Sintenis' guava	Psidium	sintenisii	PSSI2	U	U	U	C, U	C	.	.	.
.	.	.	.	8361	cachimbo-cumun	Psychotria	berteriana	PSBE	U	U	U	C, U	C	.	.	.
.	.	.	.	8362	palo de cachimbo	Psychotria	brachiata	PSBR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8363	Browne's wild coffee	Psychotria	brownei	PSBR3	U	U	U	C, U	C	.	.	.
.	.	.	.	8368	chimei	Psychotria	carolinensis	PSCA18	U	P, U	U	U	.	P	.	.
.	.	.	.	8413	Psychotria cheathamiana	Psychotria	cheathamiana	PSCH4	U	P, U	U	U	.	P	.	.
.	.	.	.	8364	Psychotria domingensis	Psychotria	domingensis	PSDO2	U	U	U	C, U	C	.	.	.
.	.	.	.	8365	Koolau Range wild coffee	Psychotria	fauriei	PSFA	U	P, U	U	U	.	P	.	.
.	.	.	.	8366	largeflower wild coffee	Psychotria	grandiflora	PSGR	U	P, U	U	U	.	P	.	.
.	.	.	.	8367	cachimbo grande	Psychotria	grandis	PSGR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8369	Kauai wild coffee	Psychotria	greenwelliae	PSGR3	U	P, U	U	U	.	P	.	.
.	.	.	.	8370	Waianae Range wild coffee	Psychotria	hathewayi	PSHA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8373	kopikoula	Psychotria	hawaiiensis	PSHA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8377	woodland wild coffee	Psychotria	hexandra	PSHE2	U	P, U	U	U	.	P	.	.

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.	.	.	.	8382	Oahu wild coffee	Psychotria	hexandra ssp. oahuensis	PSHEO	U	P, U	U	U	.	P	.	.
.	.	.	.	8386	milolii kopiwai	Psychotria	hobdyi	PSHO	U	P, U	U	U	.	P	.	.
.	.	.	.	8387	matalafi	Psychotria	insularum	PSIN10	U	P, U	U	U	.	P	.	.
.	.	.	.	8388	kopiko kea	Psychotria	kaduana	PSKA	U	P, U	U	U	.	P	.	.
.	.	.	.	8389	cachimbo de gato	Psychotria	maleolens	PSMA4	U	U	U	C, U	C	.	.	.
.	.	.	.	8390	aplohkateng	Psychotria	mariana	PSYMAR	U	P, U	U	U	.	P	.	.
.	.	.	.	8391	cachimbo de maricao	Psychotria	maricaensis	PSMA5	U	U	U	C, U	C	.	.	.
.	.	.	.	8392	forest wild coffee	Psychotria	mariniana	PSMA6	U	P, U	U	U	.	P	.	.
.	.	.	.	8393	opiko	Psychotria	mauiensis	PSMA7	U	P, U	U	U	.	P	.	.
.	.	.	.	8395	floating balsamo	Psychotria	nutans	PSNU2	U	U	U	C, U	C	.	.	.
.	.	.	.	8397	hairy wild coffee	Psychotria	pubescens	PSPU	U	U	U	C, U	C	.	.	.
.	.	.	.	8398	Psychotria rhombocarpa	Psychotria	rhombocarpa	PSRH2	U	P, U	U	U	.	P	.	.
.	.	.	.	8399	Psychotria rotensis	Psychotria	rotensis	PSRO2	U	P, U	U	U	.	P	.	.
.	.	.	.	8400	wild coffee	Psychotria	spp.	PSYCH	U	P, U	U	U	.	P	.	.
.	.	.	.	8401	leatherleaf wild coffee	Psychotria	wawrae	PSWA2	U	P, U	U	U	.	P	.	.
.	.	.	.	6381	Olasina	Psydrax	merrillii	CAME35	U	P, U	U	U	.	P	.	.
.	.	.	.	8402	alahee	Psydrax	odorata	PSOD	U	P, U	U	U	.	P	.	.
.	.	.	.	8404	Kauai pteralyxia	Pteralyxia	kauaiensis	PTKA	U	P, U	U	U	.	P	.	.
.	.	.	.	8405	ridged pteralyxia	Pteralyxia	macrocarpa	PTMA	U	P, U	U	U	.	P	.	.
.	.	.	.	8407	pterocarpus	Pterocarpus	indicus	PTIN2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8408	Burma padauk	Pterocarpus	macrocarpus	PTMA7	U	U	U	C, U	C	.	.	.
.	.	.	.	8409	Malabar kino	Pterocarpus	marsupium	PTMA3	U	U	U	C, U	C	.	.	.
.	.	.	.	8410	dragonsblood tree	Pterocarpus	officinalis	PTOF	U	U	U	C, U	C	.	.	.
.	.	.	.	8411	Chinese wingnut	Pterocarya	stenoptera	PTST80	U	U	U	U	.	.	U	.
.	.	.	.	8412	Ptychococcus ledermannianus	Ptychococcus	ledermannianus	PTLE3	U	P, U	U	U	.	P	.	.
.	.	.	.	8415	Macarthur feather palm	Ptychosperma	macarthuri	PTMA8	U	P, U	U	U	.	P	.	.
.	.	.	.	8416	chesdbuuch	Ptychosperma	palauense	PTPA	U	P, U	U	U	.	P	.	.
.	.	.	.	8419	pomegranate	Punica	granatum	PUGR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8421	Callery pear	Pyrus	calleryana	PYCA80	U	U	U	U	.	.	U	.
.	.	.	.	8423	common pear	Pyrus	communis	PYCO	.	U	U	U	.	.	U	.
.	.	.	.	8426	Chinese pear	Pyrus	pyrifolia	PYPY2	.	U	U	U	.	.	U	.
.	5, 6, 10	.	.	8420	pear spp.	Pyrus	Spp.	PYRUS	U	U	U	U	.	.	U	.
.	.	.	.	8422	swizzlestick tree	Quararibea	turbinata	QUTU	U	U	U	C, U	C	.	.	.
.	.	.	.	8427	sawtooth oak	Quercus	acutissima	QUAC80	U	U	U	U	.	.	U	.
.	.	.	.	801	California live oak	Quercus	agrifolia	QUAG	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	802	white oak	Quercus	alba	QUAL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	803	Arizona white oak	Quercus	arizonica	QUAR	R, U	PNWS, U	R, U	R, U	.	.	.	P2

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.	.	.	.	6768	Arkansas oak	Quercus	arkansana	QUAR2	U	U	U	U	.	.	U	.
.	.	.	.	8429	bastard white oak	Quercus	austrina	QUAU	U	U	U	U	.	.	U	.
.	.	.	.	804	swamp white oak	Quercus	bicolor	QUBI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8513	Buckley oak	Quercus	buckleyi	QUBU2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	8437	European turkey oak	Quercus	cerris	QUCE	U	U	U	U	.	.	U	.
.	3	.	.	805	canyon live oak	Quercus	chrysolepis	QUCH2	R, U	PNWS, U	U	U	.	.	.	P2
.	.	.	.	806	scarlet oak	Quercus	coccinea	QUCO2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	807	blue oak	Quercus	douglasii	QUDO	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	809	northern pin oak	Quercus	ellipsoidalis	QUEL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	810	Emory oak	Quercus	emoryi	QUEM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	811	Engelmann oak	Quercus	engelmannii	QUEN	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	812	southern red oak	Quercus	falcata	QUFA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8438	Texas live oak	Quercus	fusiformis	QUFU	U	U	U	U	.	.	U	.
.	.	.	w	814	Gambel oak	Quercus	gambelii	QUGA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	815	Oregon white oak	Quercus	garryana	QUGA4	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8441	sand live oak	Quercus	geminata	QUGE2	U	U	U	U	.	.	U	.
.	.	.	.	6782	Georgia oak	Quercus	georgiana	QUGE	U	U	U	U	.	.	U	.
.	.	.	.	851	Chisos oak	Quercus	graciliformis	QUGR	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	8511	Graves oak	Quercus	gravesii	QUGR2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	w	846	gray oak	Quercus	grisea	QUGR3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8449	Darlington oak	Quercus	hemisphaerica	QUHE2	U	U	U	U	.	.	U	.
.	.	.	w	843	silverleaf oak	Quercus	hypoleucoides	QUHY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8450	holly oak	Quercus	ilex	QUIL2	U	U	U	U	.	.	U	.
.	.	.	.	816	scrub oak	Quercus	ilicifolia	QUIL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	817	shingle oak	Quercus	imbricaria	QUIM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	842	bluejack oak	Quercus	incana	QUIN	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	818	California black oak	Quercus	kelloggii	QUKE	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	8514	Lacey oak	Quercus	laceyi	QULA	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	819	turkey oak	Quercus	laevis	QULA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	820	laurel oak	Quercus	laurifolia	QULA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	821	California white oak	Quercus	lobata	QULO	R, U	PNWS, U	R, U	U	.	.	.	P2
.	.	.	.	822	overcup oak	Quercus	lyrata	QULY	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	823	bur oak	Quercus	macrocarpa	QUMA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	840	dwarf post oak	Quercus	margarettiae	QUMA6	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	824	blackjack oak	Quercus	marilandica	QUMA3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	825	swamp chestnut oak	Quercus	michauxii	QUMI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	841	dwarf live oak	Quercus	minima	QUMI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	826	chinkapin oak	Quercus	muehlenbergii	QUMU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6791	myrtle oak	Quercus	myrtifolia	QUMY	U	U	U	U	.	.	U	.

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.	.	.	.	827	water oak	Quercus	nigra	QUNI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	829	Mexican blue oak	Quercus	oblongifolia	QUOB	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	844	Oglethorpe oak	Quercus	oglethorpensis	QUOG	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	813	cherrybark oak	Quercus	pagoda	QUPA5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	830	pin oak	Quercus	palustris	QUPA2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6794	durmast oak	Quercus	petraea	QUPE2	U	U	U	U	.	.	U	.
.	.	.	.	831	willow oak	Quercus	phellos	QUPH	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8512	Mexican white oak	Quercus	polymorpha	QUPO2	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	845	dwarf chinkapin oak	Quercus	prinoides	QUPR	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	832	chestnut oak	Quercus	prinus	QUPR2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6797	English oak	Quercus	robur	QURO2	U	U	U	U	.	.	U	.
.	.	.	.	8492	robust oak	Quercus	robusta	QURO3	U	U	U	U	.	.	U	.
.	.	.	.	833	northern red oak	Quercus	rubra	QURU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	w	847	netleaf oak	Quercus	rugosa	QURU4	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	834	Shumard oak	Quercus	shumardii	QUSH	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	836	Delta post oak	Quercus	similis	QUSI2	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	808	Durand oak	Quercus	sinuata var. sinuata	QUSIS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6799	bastard oak	Quercus	sinuata	QUSI	U	U	U	U	.	.	U	.
.	.	.	.	8487	bastard oak	Quercus	sinuata var. breviloba	QUSIB	U	U	U	U	.	.	U	.
.	.	.	.	835	post oak	Quercus	stellata	QUST	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8424	cork oak	Quercus	suber	QUSU5	U	P, U	U	U	.	P	.	.
.	.	.	.	8455	lateleaf oak	Quercus	tardifolia	QUTA	U	U	U	U	.	.	U	.
.	.	.	.	828	Texas red oak	Quercus	texana	QUTE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8461	sandpaper oak	Quercus	vaseyana	QUVA5	.	U	U	U	.	.	U	.
.	.	.	.	837	black oak	Quercus	velutina	QUVE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	838	live oak	Quercus	virginiana	QUVI	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	839	interior live oak	Quercus	wislizeni	QUWI2	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8425	white indigoberry	Randia	aculeata	RAAC	U	U	U	C, U	C	.	.	.
.	.	.	.	8430	togo vao	Rapanea	myricifolia	RAMY	U	P, U	U	U	.	P	.	.
.	.	.	.	8432	omechidel	Rauvolfia	insularis	RAIN8	U	P, U	U	U	.	P	.	.
.	.	.	.	8433	palo amargo	Rauvolfia	nitida	RANI2	U	U	U	C, U	C	.	.	.
.	.	.	.	8434	devils-pepper	Rauvolfia	sandwicensis	RASA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8431	poison devils-pepper	Rauvolfia	vomitoria	RAVO	U	P, U	U	U	.	P	.	.
.	.	.	.	8436	traveler's tree	Ravenala	madagascariensis	RAMA7	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8439	tortugo prieto	Ravenia	urbanii	RAUR	U	U	U	C, U	C	.	.	.
.	.	.	.	8440	vi vao	Reynoldsia	lanutoensis	RELA	U	P, U	U	U	.	P	.	.
.	.	.	.	8442	ohe makai	Reynoldsia	sandwicensis	RESA	U	P, U	U	U	.	P	.	.
.	.	.	.	8444	guama	Reynosia	guama	REGU	U	U	U	C, U	C	.	.	.
.	.	.	.	8445	Krug's darlingplum	Reynosia	krugii	REKR	U	U	U	C, U	C	.	.	.

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.	.	.	.	8447	sloe	Reynosia	uncinata	REUN	U	U	U	C, U	C	.	.	.
.	.	.	.	6918	common buckthorn	Rhamnus	cathartica	RHCA3	U	U	U	U	.	.	U	.
.	.	.	.	8456	Rheeda	Rheedia	edulis	RHED4	U	P, U	U	U	.	P	.	.
.	.	.	.	8458	mangle	Rhizophora	apiculata	RHAP2	U	P, U	U	U	.	P	.	.
.	.	.	.	8460	Rhizophora lamarckii	Rhizophora	lamarckii	RHLA12	U	P, U	U	U	.	P	.	.
.	.	.	.	989	American mangrove	Rhizophora	mangle	RHMA2	R, U	PNWS, P, U	R, U	R, C, U	C	P	.	P2
.	.	.	.	8462	mangle hembra	Rhizophora	mucronata	RHMU	U	P, U	U	U	.	P	.	.
.	.	.	.	8464	Rhizophora stylosa	Rhizophora	stylosa	RHST8	U	P, U	U	U	.	P	.	.
.	.	.	.	8471	Catawba rosebay	Rhododendron	catawbiense	RHCA8	U	U	U	U	.	.	U	.
.	.	.	.	8466	Rhodomyrtus tomentosus	Rhodomyrtus	tomentosa	RHTO10	U	P, U	U	U	.	P	.	.
.	.	.	.	8470	African sumac	Rhus	lancea	RHLA11	U	U	U	U	.	.	U	.
.	.	.	.	8479	prairie sumac	Rhus	lanceolata	RHLA3	U	U	U	U	.	.	U	.
.	.	.	.	8467	neneleau	Rhus	sandwicensis	RHSA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8469	tavai	Rhus	taitensis	RHTA	U	P, U	U	U	.	P	.	.
.	3	.	.	8472	castorbean	Ricinus	communis	RICO3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8474	Rinorea carolinensis	Rinorea	carolinensis	RICA16	U	P, U	U	U	.	P	.	.
NUE	.	.	w	902	New Mexico locust	Robinia	neomexicana	RONE	R, U	PNWS, U	.	R, U	.	.	.	P2
.	.	.	.	901	black locust	Robinia	pseudoacacia	ROPS	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8476	greenheart ebony	Rochefortia	acanthophora	ROAC2	U	U	U	C, U	C	.	.	.
.	.	.	.	8478	Rochefortia spinosa	Rochefortia	spinosa	ROSP8	U	U	U	C, U	C	.	.	.
.	.	.	.	8480	Rollinia	Rollinia	deliciosa	RODE5	U	P, U	U	U	.	P	.	.
.	.	.	.	8481	wild sugar apple	Rollinia	mucosa	ROMU3	U	U	U	C, U	C	.	.	.
.	.	.	.	8483	cordobancillo	Rondeletia	inermis	ROIN4	U	U	U	C, U	C	.	.	.
.	.	.	.	8484	cordobancillo peludo	Rondeletia	pilosa	ROPI3	U	U	U	C, U	C	.	.	.
.	.	.	.	8485	Juan Tomas	Rondeletia	portoricensis	ROPO	U	U	U	C, U	C	.	.	.
.	.	.	.	8489	Puerto Rico royal palm	Roystonea	borinquena	ROBO	U	U	U	C, U	C	.	.	.
.	.	.	.	8490	Roystonea elata	Roystonea	elata	ROEL	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8491	royal palm	Roystonea	oleracea	ROOL	U	P, U	U	U	.	P	.	.
.	.	.	.	909	royal palm spp.	Roystonea	spp.	ROYST	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	8494	Puerto Rico palmetto	Sabal	causiarum	SACA	U	U	U	C, U	C	.	.	.
.	.	.	.	911	Mexican palmetto	Sabal	mexicana	SAME8	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	8495	dwarf palmetto	Sabal	minor	SAMI8	U	U	U	U	.	.	U	.
.	.	.	.	912	cabbage palmetto	Sabal	palmetto	SAPA	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8499	white hogwood	Sagraea	umbrosa	SAUM3	U	U	U	C, U	C	.	.	.
.	.	.	.	927	white willow	Salix	alba	SAAL2	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	921	peachleaf willow	Salix	amygdaloides	SAAM2	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	924	Bonpland willow	Salix	bonplandiana	SABO	R, U	U	U	R, U	.	.	.	P2

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.	.	.	.	925	coastal plain willow	Salix	caroliniana	SACA5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	6954	Elaeagnus willow	Salix	elaeagnos	SAEL	U	U	U	U	.	.	U	.
.	.	.	.	6955	crack willow	Salix	fragilis	SAFR	.	.	.	.	.	.	.	.
.	.	.	.	8501	Salix humboldtiana	Salix	humboldtiana	SAHU	U	U	U	C, U	C	.	.	.
NUE	.	.	.	8504	arroyo willow	Salix	lasiolepis	SALA6	.	U	U	U	.	.	U	.
.	.	.	.	922	black willow	Salix	nigra	SANI	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	926	balsam willow	Salix	pyrifolia	SAPY	R, U	PNWS, U	R, U	U	.	.	.	P2
NUE	.	.	.	928	Scouler's willow	Salix	scouleriana	SASC	R, U	U	.	U	.	.	.	P2
.	.	.	.	929	weeping willow	Salix	sepulcralis	SASE10	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8524	silky willow	Salix	sericea	SASE	U	U	U	U	.	.	U	.
.	.	.	.	8503	etkeam, cheskeam	Samadera	indica	SAIN13	U	P, U	U	U	.	P	.	.
.	.	.	.	8505	raintree	Samanea	saman	SASA10	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8556	guayabilla	Samyda	dodecandra	SADO7	U	U	U	C, U	C	.	.	.
.	.	.	.	8515	santol, kechapi	Sandoricum	koetjape	SAKO4	U	P, U	U	U	.	P	.	.
.	.	.	.	8518	sandalwood	Santalum	album	SAAL16	U	P, U	U	U	.	P	.	.
.	.	.	.	8516	coastal sandalwood	Santalum	ellipticum	SAEL2	U	P, U	U	U	.	P	.	.
.	.	.	.	8517	forest sandalwood	Santalum	freycinetianum	SAFR4	U	P, U	U	U	.	P	.	.
.	.	.	.	8521	Haleakala sandalwood	Santalum	haleakalae	SAHA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8522	mountain sandalwood	Santalum	paniculatum	SAPA7	U	P, U	U	U	.	P	.	.
.	.	.	.	8525	willowleaf sandalwood	Santalum	salicifolium	SASA8	U	P, U	U	U	.	P	.	.
.	.	.	.	8528	lonomea	Sapindus	oahuense	SAOA3	U	P, U	U	U	.	P	.	.
.	.	.	.	919	western soapberry	Sapindus	saponaria var. drummondii	SASAD	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	8529	wingleaf soapberry	Sapindus	saponaria	SASA4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8532	vitiensis	Sapindus	vitiensis	SAVI17	U	P, U	U	U	.	P	.	.
.	.	.	.	8533	gumtree	Sapium	glandulosum	SAGL5	U	U	U	C, U	C	.	.	.
.	.	.	.	8535	hinchahuevos	Sapium	laurifolium	SALA25	U	U	U	C, U	C	.	.	.
.	.	.	.	8536	milktree	Sapium	laurocerasus	SALA8	U	U	U	C, U	C	.	.	.
.	.	.	.	8544	uunu	Sarcopygme	pacifica	SAPA35	U	P, U	U	U	.	P	.	.
.	.	.	.	931	sassafras	Sassafras	albidum	SAAL5	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8546	amansa guapo	Savia	sessiliflora	SASE6	U	U	U	C, U	C	.	.	.
.	.	.	.	8554	Florida boxwood	Schaefferia	frutescens	SCFR	U	U	U	C, U	C	.	.	.
.	.	.	.	888	octopus tree, schefflera	Schefflera	actinophylla	SCAC2	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	8557	yuquilla	Schefflera	gleasonii	SCGL6	U	U	U	C, U	C	.	.	.
.	.	.	.	8553	Schefflera kraemeri	Schefflera	kraemeri	SCKR2	U	P, U	U	U	.	P	.	.
.	.	.	.	8558	matchwood	Schefflera	morototonii	SCMO10	U	U	U	C, U	C	.	.	.
.	.	.	.	8559	samoensis	Schefflera	samoensis	SCSA10	U	P, U	U	U	.	P	.	.
.	.	.	.	8561	Peruvian peppertree	Schinus	molle	SCMO	U	P, U	U	U	.	P	U	.

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.	.	.	.	8563	Brazilian peppertree	Schinus	terebinthifolius	SCTE	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8565	Brazilian firetree	Schizolobium	parahybum	SCPA23	U	U	U	C, U	C	.	.	.
.	.	.	.	8567	lac tree	Schleichera	oleosa	SCOL3	U	U	U	C, U	C	.	.	.
.	.	.	.	7564	Schleinitzia fosbergii	Schleinitzia	fosbergii	SCFO2	U	P, U	U	U	.	P	.	.
.	.	.	.	8571	arana	Schoepfia	arenaria	SCAR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8572	white beefwood	Schoepfia	obovata	SCOB	U	U	U	C, U	C	.	.	.
.	.	.	.	8573	gulf graytwig	Schoepfia	schreberi	SCSC3	U	U	U	C, U	C	.	.	.
.	.	.	.	8577	kuat	Scyphiphora	hydrophyllacea	SCHY5	U	P, U	U	U	.	P	.	.
.	.	.	.	8583	poumuli	Securinega	flexuosa	SEFL9	U	P, U	U	U	.	P	.	.
.	.	.	.	8585	poison tree, panew	Semecarpus	kraemeri	SEKR3	U	P, U	U	U	.	P	.	.
.	.	.	.	8586	tonget	Semecarpus	venenosa	SEVE4	U	P, U	U	U	.	P	.	.
.	.	.	.	8588	emperor's candlesticks	Senna	alata	SEAL4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8589	flor de San Jose	Senna	atomaria	SEAT3	U	U	U	C, U	C	.	.	.
.	.	.	.	7023	Argentine senna	Senna	corymbosa	SECO9	U	U	U	U	.	.	U	.
.	.	.	.	8590	Gaudichauds senna	Senna	gaudichaudii	SEGA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8591	false sicklepod	Senna	multijuga	SEMU5	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8592	valamuerto	Senna	pendula	SEPE4	U	P, U	U	U	.	P	.	.
.	.	.	.	8594	retama prieta	Senna	polyphylla	SEPO5	U	U	U	C, U	C	.	.	.
.	.	.	.	8595	senna	Senna	septemtrionalis	SESE13	U	P, U	U	U	.	P	.	.
.	.	.	.	8596	Siamese cassia	Senna	siamea	SESI3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8597	casia amarilla	Senna	spectabilis	SESP9	U	U	U	C, U	C	.	.	.
.	.	.	.	8598	senna	Senna	spp.	SENNA	U	P, U	U	U	.	P	.	.
.	.	.	.	8599	Senna sulfurea	Senna	sulfurea	SESU10	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8600	glossy shower	Senna	surattensis	SESU4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8601	ukall	Serianthes	kanehirae	SEKA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8603	hayun lago, trongkon guafi	Serianthes	nelsonii	SENE9	U	P, U	U	U	.	P	.	.
.	.	.	.	8605	vegetable hummingbird	Sesbania	grandiflora	SEGR5	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8606	Egyptian riverhemp	Sesbania	sesban	SESE8	U	P, U	U	U	.	P	.	.
.	.	.	.	8608	Shirakiopsis indica	Shirakiopsis	indica	SHIN	U	P, U	U	U	.	P	.	.
.	.	.	.	8612	saffron plum	Sideroxylon	celastrinum	SICE2	U	U	U	U	.	.	U	.
.	.	.	.	8611	espejuelo	Sideroxylon	cubense	SICU7	U	U	U	C, U	C	.	.	.
.	.	.	.	890	false mastic	Sideroxylon	foetidissimum	SIFO	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	8618	Tamaulipan Coma	Sideroxylon	laetevirens	SILA4	U	U	U	U	.	.	U	.
.	.	.	.	381	chittamwood, gum bumelia	Sideroxylon	lanuginosum ssp. lanuginosum	SILAL3	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	8615	buckthorn bully	Sideroxylon	lycioides	SILY	U	U	U	U	.	.	U	.
.	.	.	.	8613	breakbill	Sideroxylon	obovatum	SIOB	U	U	U	C, U	C	.	.	.
.	.	.	.	8621	Bully tree	Sideroxylon	persimile	SIPE11	.	.	.	.	.	.	.	.

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.	.	.	.	8614	Puerto Rico bully	Sideroxylon	portoricense	SIPO3	U	U	U	C, U	C	.	.	.
.	.	.	.	891	white bully, willow bustic	Sideroxylon	salicifolium	SISA6	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	8616	tough bully	Sideroxylon	tenax	SITE2	U	U	U	U	.	.	U	.
.	.	.	.	895	paradisetree	Simarouba	glauca	SIGL3	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	8617	simarouba	Simarouba	spp.	SIMAR	U	U	U	C, U	C	.	.	.
.	.	.	.	8619	aceitillo falso	Simarouba	tulae	SITU	U	U	U	C, U	C	.	.	.
.	.	.	.	8620	hoja menuda	Siphoneugena	densiflora	SIDE6	U	U	U	C, U	C	.	.	.
.	.	.	.	8623	motillo	Sloanea	amygdalina	SLAM	U	U	U	C, U	C	.	.	.
.	.	.	.	8624	bullwood	Sloanea	berteriana	SLBE	U	U	U	C, U	C	.	.	.
.	.	.	.	8622	bullwood	Sloanea	spp.	SLOAN	U	U	U	C, U	C	.	.	.
.	.	.	.	8628	American black nightshade	Solanum	americanum	SOAM	U	P, U	U	U	.	P	.	.
.	.	.	.	8626	Solanum bahamense	Solanum	bahamense	SOBAB	U	U	U	C, U	C	.	.	.
.	.	.	.	8627	mullein nightshade	Solanum	donianum	SODO3	U	U	U	C, U	C	.	.	.
.	.	.	.	8629	potatotree	Solanum	erianthum	SOER2	U	U	U	C, U	C	.	.	.
.	.	.	.	8631	earleaf nightshade	Solanum	mauritianum	SOMA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8632	forest nightshade	Solanum	nudum	SONU4	U	U	U	C, U	C	.	.	.
.	.	.	.	8633	cakalaka berry	Solanum	polygamum	SOPO	U	U	U	C, U	C	.	.	.
.	.	.	.	8634	tabacon aspero	Solanum	rugosum	SORU	U	U	U	C, U	C	.	.	.
.	.	.	.	8636	turkey berry	Solanum	torvum	SOTO4	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8639	mangrove	Sonneratia	alba	SOAL10	U	P, U	U	U	.	P	.	.
.	.	.	.	870	Texas sophora	Sophora	affinis	SOAF	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	8641	mamani	Sophora	chrysophylla	SOCH	U	P, U	U	U	.	P	.	.
.	.	.	.	8648	mescal bean	Sophora	secundiflora	SOSE3	U	U	U	U	.	.	U	.
.	.	.	.	8643	silver bush	Sophora	tomentosa	SOTO3	U	P, U	U	U	.	P	.	.
.	.	.	.	935	American mountain-ash	Sorbus	americana	SOAM3	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	936	European mountain-ash	Sorbus	aucuparia	SOAU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	937	northern mountain-ash	Sorbus	decora	SODE3	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8660	maras	Soulamea	amara	SOAM2	U	P, U	U	U	.	P	.	.
.	.	.	.	8644	African tuliptree	Spathodea	campanulata	SPCA2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8646	Spiraeanthemum samoense	Spiraeanthemum	samoense	SPSA7	U	P, U	U	U	.	P	.	.
.	.	.	.	8649	Spondias dulcis	Spondias	dulcis	SPDU3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8650	yellow mombin	Spondias	mombin	SPMO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8656	titmel	Spondias	pinnata	SPPI4	U	P, U	U	U	.	P	.	.
.	.	.	.	8652	purple mombin	Spondias	purpurea	SPPU	U	U	U	C, U	C	.	.	.
.	.	.	.	8654	cobana negra	Stahlia	monosperma	STMO	U	U	U	C, U	C	.	.	.
.	.	.	.	8655	ngmui	Stemonurus	ammui	STAM10	U	P, U	U	U	.	P	.	.
.	.	.	.	8664	Panama tree	Sterculia	apetala	STAP	U	U	U	C, U	C	.	.	.

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.	.	.	.	8665	fanaio	Sterculia	fanaiho	STFA5	U	P, U	U	U	.	P	.	.
.	.	.	.	8666	hazel sterculia	Sterculia	foetida	STFO2	U	U	U	C, U	C	.	.	.
.	.	.	.	8667	Sterculia palauensis	Sterculia	palauensis	STPA20	U	P, U	U	U	.	P	.	.
.	.	.	.	8868	Sterculia ponapensis	Sterculia	ponapensis	STPO10	U	P, U	U	U	.	P	.	.
.	.	.	.	8675	Stewartia	Stewartia	koreana	STKO2	U	U	U	U	.	.	U	.
.	.	.	.	8668	silky camellia	Stewartia	malacodendron	STMA	U	U	U	U	.	.	U	.
.	.	.	.	8672	mountain camellia	Stewartia	ovata	STOV	U	U	U	U	.	.	U	.
.	.	.	.	8669	anthropophagorum	Streblus	anthropophagorum	STAN9	U	P, U	U	U	.	P	.	.
.	.	.	.	8670	Hawaii roughbush	Streblus	pendulinus	STPE3	U	P, U	U	U	.	P	.	.
.	.	.	.	8647	Japanese pagoda tree	Styphnolobium	japonicum	STJA9	U	U	U	U	.	.	U	.
.	.	.	.	8673	American snowbell	Styrax	americanus	STAM4	U	U	U	U	.	.	U	.
.	.	.	.	7083	bigleaf snowbell	Styrax	grandifolius	STGR4	U	U	U	U	.	.	U	.
.	.	.	.	8674	palo de jazmin	Styrax	portoricensis	STPO3	U	U	U	C, U	C	.	.	.
.	.	.	.	8676	bay cedar	Suriana	maritima	SUMA2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8679	Honduras mahogany	Swietenia	macrophylla	SWMA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	940	West Indian mahogany	Swietenia	mahagoni	SWMA2	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	8678	mahogany	Swietenia	spp.	SWIET	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8686	queen palm	Syagrus	romanzoffiana	SYRO4	U	U	U	U	.	.	U	.
.	.	.	.	8683	nispero cimarron	Symplocos	lanata	SYLA2	U	U	U	C, U	C	.	.	.
.	.	.	.	8684	Martinique sweetleaf	Symplocos	martinicensis	SYMA	U	U	U	C, U	C	.	.	.
.	.	.	.	8685	aceitunilla	Symplocos	micrantha	SYMI3	U	U	U	C, U	C	.	.	.
.	.	.	.	8687	chebtui, ebtui	Symplocos	racemosa	SYRA6	U	P, U	U	U	.	P	.	.
.	.	.	.	8689	turpentine tree	Syncarpia	glomulifera	SYGL	U	P, U	U	U	.	P	.	.
.	.	.	.	8691	Miracle Berry	Synsepalum	dulcificum	SYDU	U	P, U	U	U	.	P	.	.
.	.	.	.	7092	Japanese tree lilac	Syringa	reticulata	SYRE2	U	U	U	U	.	.	U	.
.	.	.	.	8694	watery roseapple	Syzygium	aqueum	SYAQ	U	P, U	U	U	.	P	.	.
.	.	.	.	8695	asi	Syzygium	brevifolium	SYBR3	U	P, U	U	U	.	P	.	.
.	.	.	.	8696	popona	Syzygium	carolinense	SYCA4	U	P, U	U	U	.	P	.	.
.	.	.	.	8697	asi vai	Syzygium	clusiifolium	SYCL	U	P, U	U	U	.	P	.	.
.	.	.	.	896	Java plum	Syzygium	cumini	SYCU	R, U	P, U	U	R, U	.	P	.	P2
.	.	.	.	8699	asi vai	Syzygium	dealatum	SYDE3	U	P, U	U	U	.	P	.	.
.	.	.	.	8698	sea apple	Syzygium	grande	SYGR2	U	U	U	U	.	.	U	.
.	.	.	.	8700	asi	Syzygium	inophylloides	SYIN2	U	P, U	U	U	.	P	.	.
.	.	.	.	8701	Syzygium jambos	Syzygium	jambos	SYJA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8702	Malaysian apple	Syzygium	malaccense	SYMA2	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8707	brush cherry	Syzygium	paniculatum	SYPA7	U	U	U	U	.	.	U	.
.	.	.	.	8703	popona	Syzygium	richii	SYRI3	U	P, U	U	U	.	P	.	.
.	.	.	.	8704	nonu vao	Syzygium	samarangense	SYSA3	U	P, U	U	U	.	P	.	.

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.	.	.	.	8705	fena vao	Syzygium	samoense	SYSA6	U	P, U	U	U	.	P	.	.
.	.	.	.	8706	ohia ha	Syzygium	sandwicense	SYSA	U	P, U	U	U	.	P	.	.
.	.	.	.	8708	syzygium	Syzygium	spp.	SYZYG	U	P, U	U	U	.	P	.	.
.	.	.	.	7099	luluhut	Syzygium	stelechanthum	SYST3	U	P, U	U	U	.	P	.	.
.	.	.	.	8709	roble amarillo	Tabebuia	chrysantha	TACH3	U	U	U	C, U	C	.	.	.
.	.	.	.	8710	primavera	Tabebuia	donnell-smithii	TADO2	U	U	U	C, U	C	.	.	.
.	.	.	.	8712	roble cimarron	Tabebuia	haemantha	TAHA	U	U	U	C, U	C	.	.	.
.	.	.	.	8713	white cedar	Tabebuia	heterophylla	TAHE	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8714	pink tabebuia	Tabebuia	pallida	TAPA10	U	P, U	U	U	.	P	.	.
.	.	.	.	8715	roble de sierra	Tabebuia	rigida	TARI	U	U	U	C, U	C	.	.	.
.	.	.	.	8716	pink trumpet-tree	Tabebuia	rosea	TARO	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8717	roble colorado	Tabebuia	schumanniana	TASC2	U	U	U	C, U	C	.	.	.
.	.	.	.	8719	Tabernaemontana aurantiaca	Tabernaemontana	aurantiaca	TAAU3	U	P, U	U	U	.	P	.	.
.	.	.	.	8720	milkwood	Tabernaemontana	citrifolia	TACI	U	U	U	C, U	C	.	.	.
.	.	.	.	8722	Pulu	Tabernaemontana	pandacaqui	TAPA13	U	P, U	U	U	.	P	.	.
.	.	.	.	8723	Tabernaemontana rotensis	Tabernaemontana	rotensis	TARO3	U	P, U	U	U	.	P	.	.
.	.	.	.	897	tamarind	Tamarindus	indica	TAIN2	R, U	P, U	U	R, C, U	C	P	.	P2
.	.	.	.	8737	manunu	Tarenna	sambucina	TASA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8741	chestnutleaf trumpetbush	Tecoma	castanifolia	TECA9	U	P, U	U	U	.	P	.	.
.	.	.	.	8743	yellow trumpetbush	Tecoma	stans	TEST	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8744	teak	Tectona	grandis	TEGR	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8749	kehma	Terminalia	carolinensis	TECA16	U	P, U	U	U	.	P	.	.
.	.	.	.	8750	tropical almond	Terminalia	catappa	TECA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8751	esemiich, chesemiich	Terminalia	crassipes	TECR3	U	P, U	U	U	.	P	.	.
.	.	.	.	8752	esemiich, chesemiich	Terminalia	edulis	TEED	U	P, U	U	U	.	P	.	.
.	.	.	.	8754	Ivory Coast almond	Terminalia	ivorensis	TEIV2	U	U	U	C, U	C	.	.	.
.	.	.	.	8755	tropical almond	Terminalia	kaernbachii	TEKA4	U	P, U	U	U	.	P	.	.
.	.	.	.	8753	strand tree, sin	Terminalia	litoralis	TELI7	U	P, U	U	U	.	P	.	.
.	.	.	.	8756	East Indian almond	Terminalia	myriocarpa	TEMY	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8757	Peruvian almond	Terminalia	oblonga	TEOB	U	U	U	C, U	C	.	.	.
.	.	.	.	8758	malili	Terminalia	richii	TERI3	U	P, U	U	U	.	P	.	.
.	.	.	.	8759	talie	Terminalia	samoensis	TESA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8748	tropical almond	Terminalia	spp.	TERMI	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8761	superb terminalia	Terminalia	superba	TESU2	U	U	U	C, U	C	.	.	.
.	.	.	.	8762	saintedwood	Ternstroemia	heptasepala	TEHE3	U	U	U	C, U	C	.	.	.
.	.	.	.	8763	palo colorado	Ternstroemia	luquillensis	TELU2	U	U	U	C, U	C	.	.	.
.	.	.	.	8764	copey vera	Ternstroemia	peduncularis	TEPE	U	U	U	C, U	C	.	.	.
.	.	.	.	8766	mamey de cura	Ternstroemia	stahlii	TEST3	U	U	U	C, U	C	.	.	.

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.	.	.	.	8767	el yunque colorado	Ternstroemia	subsessilis	TESU	U	U	U	C, U	C	.	.	.
.	.	.	.	8768	masa	Tetragastris	balsamifera	TEBA	U	U	U	C, U	C	.	.	.
.	.	.	.	8770	Flynnsohe	Tetraplasandra	flynnii	TEFL5	U	P, U	U	U	.	P	.	.
.	.	.	.	8771	Koolau Rangeohe	Tetraplasandra	gymnocarpa	TEGY	U	P, U	U	U	.	P	.	.
.	.	.	.	8772	Hawaii ohe	Tetraplasandra	hawaiensis	TEHA2	U	P, U	U	U	.	P	.	.
.	.	.	.	8773	ohe ohe	Tetraplasandra	kavaiensis	TEKA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8774	ohe mauka	Tetraplasandra	oahuensis	TEOA	U	P, U	U	U	.	P	.	.
.	.	.	.	8776	Mt. Waialeale ohe	Tetraplasandra	waialealae	TEWA	U	P, U	U	U	.	P	.	.
.	.	.	.	8777	ohe kiko ola	Tetraplasandra	waimeae	TEWA3	U	P, U	U	U	.	P	.	.
.	.	.	.	8778	stinkingfish	Tetrazygia	angustifolia	TEAN2	U	U	U	C, U	C	.	.	.
.	.	.	.	8779	Florida clover ash	Tetrazygia	bicolor	TEBI	U	P, U	U	U	.	P	.	.
.	.	.	.	8780	Puerto Rico clover ash	Tetrazygia	biflora	TEBI2	U	U	U	C, U	C	.	.	.
.	.	.	.	8781	krekre	Tetrazygia	elaeagnoides	TEEL	U	U	U	C, U	C	.	.	.
.	.	.	.	8783	cenizo	Tetrazygia	urbanii	TEUR	U	U	U	C, U	C	.	.	.
.	.	.	.	8784	cacao	Theobroma	cacao	THCA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8786	maga	Thespesia	grandiflora	THGR2	U	U	U	C, U	C	.	.	.
.	.	.	.	8787	Portia tree	Thespesia	populnea	THPO3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8789	luckynut	Thevetia	peruviana	THPE3	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8793	ceboruquillo	Thouinia	striata	THST2	U	U	U	C, U	C	.	.	.
.	.	.	.	8794	Puerto Rico ceboruquillo	Thouinia	striata var. portoricensis	THSTP	U	U	U	C, U	C	.	.	.
.	.	.	.	913	key thatch palm	Thrinax	morrisii	THMO4	R, U	U	U	R, C, U	C	.	.	P2
.	.	.	.	914	Florida thatch palm	Thrinax	radiata	THRA2	R, U	U	U	R, U	.	.	.	P2
.	.	.	.	8803	Brazilian glorytree	Tibouchina	granulosa	TIGR3	U	U	U	C, U	C	.	.	.
.	.	.	.	951	American basswood	Tilia	americana	TIAM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	952	white basswood	Tilia	americana var. heterophylla	TIAMH	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	953	Carolina basswood	Tilia	americana var. caroliniana	TIAMC	R, U	PNWS, U	U	R, U	.	.	.	P2
.	.	.	.	8813	littleleaf linden	Tilia	cordata	TICO2	U	U	U	U	.	.	U	.
.	.	.	.	8814	Silver linden	Tilia	tomentosa	TITO	U	U	U	U	.	.	U	.
.	.	.	.	8799	Timonius albus	Timonius	albus	TIAL2	U	P, U	U	U	.	P	.	.
.	.	.	.	8806	Timonius corymbosus	Timonius	corymbosus	TICO7	U	P, U	U	U	.	P	.	.
.	.	.	.	8800	.	Timonius	ledermanii	TILE4	U	P, U	U	U	.	P	.	.
.	.	.	.	8807	Timonius mollis	Timonius	mollis	TIMO4	U	P, U	U	U	.	P	.	.
.	.	.	.	8801	.	Timonius	ponapensis	TIPO5	U	P, U	U	U	.	P	.	.
.	.	.	.	8808	Timonius	Timonius	spp.	TIMON	U	P, U	U	U	.	P	.	.
.	.	.	.	8809	Timonius subauritus	Timonius	subauritus	TISU3	U	P, U	U	U	.	P	.	.
.	.	.	.	8810	Timonius timon	Timonius	timon	TITI	U	P, U	U	U	.	P	.	.
.	.	.	.	8815	tipa	Tipuana	tipu	TITI2	U	U	U	U	.	.	U	.

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.	.	.	.	8812	Australian redcedar	Toona	ciliata	TOCI	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8811	redcedar	Toona	spp.	TOONA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8816	boje	Torralbasia	cuneifolia	TOCU	U	U	U	C, U	C	.	.	.
.	.	.	.	8824	velvetleaf soldierbush	Tournefortia	argentea	TOAR2	U	P, U	U	U	.	P	.	.
.	.	.	.	8825	cold withe	Tournefortia	filiflora	TOFI	U	U	U	C, U	C	.	.	.
.	.	.	.	8821	Chinese windmill palm	Trachycarpus	fortunei	TRFO3	U	U	U	U	.	.	U	.
NUE	.	.	.	998	Unknown dead hardwood	Tree	broadleaf	2TB	R, U	P	R, U	R, C, U	C	P	.	P2
.	.	MLE	.	999	Other or unknown live tree	Tree	unknown	2TREE	R, U	R, U	R, U	R, C, U	C	.	.	P2
.	.	.	.	8827	magele	Trema	cannabina	TRCA33	U	P, U	U	U	.	P	.	.
.	.	.	.	8828	Lamarck's trema	Trema	lamarckianum	TRLA2	U	U	U	C, U	C	.	.	.
.	.	.	.	8829	Jamaican nettletree	Trema	micranthum	TRMI2	U	U	U	C, U	C	.	.	.
.	.	.	.	8831	oriental trema	Trema	orientalis	TROR	U	P, U	U	U	.	P	.	.
.	.	.	.	994	Chinese tallowtree	Triadica	sebifera	TRSE6	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
.	.	.	.	8833	broomstick	Trichilia	hirta	TRHI3	U	U	U	C, U	C	.	.	.
.	.	.	.	8834	gaita	Trichilia	pallida	TRPA2	U	U	U	C, U	C	.	.	.
.	.	.	.	8836	bariaco	Trichilia	triacantha	TRTR8	U	U	U	C, U	C	.	.	.
.	.	.	.	8837	Trichospermum ikutai	Trichospermum	ikutai	TRIK	U	P, U	U	U	.	P	.	.
.	.	.	.	8838	elsau, oleiulakersus	Trichospermum	ledermannii	TRLE8	U	P, U	U	U	.	P	.	.
.	.	.	.	8839	maouli	Trichospermum	richii	TRRI9	U	P, U	U	U	.	P	.	.
.	.	.	.	8842	limeberry	Triphasia	trifolia	TRTR7	U	U	U	C, U	C	.	.	.
.	.	.	.	8844	ant tree	Triplaris	cumingiana	TRCU6	U	U	U	C, U	C	.	.	.
.	.	.	.	8843	Triplaris spp.	Triplaris	spp.	TRIPL5	U	U	U	C, U	C	.	.	.
.	.	.	.	8846	faia	Tristiropsis	obtusangula	TROB7	U	P, U	U	U	.	P	.	.
.	.	.	.	8848	white ramoon	Trophis	racemosa	TRRA4	U	U	U	C, U	C	.	.	.
.	.	.	.	8849	Trukia carolinensis	Trukia	carolinensis	TRCA7	U	P, U	U	U	.	P	.	.
.	.	.	.	8850	muttonwood	Turpinia	occidentalis	TUOC	U	U	U	C, U	C	.	.	.
.	.	.	.	971	winged elm	Ulmus	alata	ULAL	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	972	American elm	Ulmus	americana	ULAM	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	973	cedar elm	Ulmus	crassifolia	ULCR	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8862	Japanese elm	Ulmus	davidiana	ULDA	U	U	U	U	.	.	U	.
.	.	.	.	8851	Chinese elm	Ulmus	parvifolia	ULPA	U	U	U	U	.	.	U	.
.	.	.	.	8852	English elm	Ulmus	procera	ULPR	U	U	U	U	.	.	U	.
.	.	.	.	974	Siberian elm	Ulmus	pumila	ULPU	R, U	PNWS, P, U	R, U	R, U	.	P	.	P2
.	.	.	.	975	slippery elm	Ulmus	rubra	ULRU	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	976	September elm	Ulmus	serotina	ULSE	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	977	rock elm	Ulmus	thomasii	ULTH	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	981	California-laurel	Umbellularia	californica	UMCA	R, U	PNWS, U	R, U	U	.	.	.	P2

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.	.	.	.	8859	Mexican buckeye	Ungnadia	speciosa	UNSP	U	U	U	U	.	.	U	.
.	.	.	.	8853	scratchbush	Urera	baccifera	URBA	U	U	U	C, U	C	.	.	.
.	.	.	.	8854	flameberry	Urera	caracasana	URCA2	U	U	U	C, U	C	.	.	.
.	.	.	.	8855	ortiga	Urera	chlorocarpa	URCH2	U	U	U	C, U	C	.	.	.
.	.	.	.	8856	hopue	Urera	glabra	URGL	U	P, U	U	U	.	P	.	.
.	.	.	.	8857	opuhe	Urera	kaalae	URKA	U	P, U	U	U	.	P	.	.
.	.	.	.	8860	farkleberry	Vaccinium	arboreum	VAAR	U	U	U	U	.	.	U	.
.	.	.	.	8861	voa vanga	Vangueria	madagascariensis	VAMA5	U	U	U	C, U	C	.	.	.
.	.	.	.	8863	Vavaea pauciflora	Vavaea	pauciflora	VAOA5	U	P, U	U	U	.	P	.	.
.	.	.	.	8866	Manila palm	Veitchia	merrillii	VEME3	U	P, U	U	U	.	P	.	.
.	.	.	.	995	tungoil tree	Vernicia	fordii	VEFO	R, U	PNWS, U	R, U	R, U	.	.	.	P2
.	.	.	.	8869	mu oil tree	Vernicia	montana	VEMO3	U	P, U	U	U	.	P	.	.
.	.	.	.	8880	Siebold's arrowwood	Viburnum	sieboldii	VISI	U	U	U	U	.	.	U	.
.	.	.	.	8871	lilac chastetree	Vitex	agnus-castus	VIAG	U	U	U	C, U	C	.	.	.
.	.	.	.	8872	bars, beokel	Vitex	cofassus	VICO17	U	P, U	U	U	.	P	.	.
.	.	.	.	8873	higuerillo	Vitex	divaricata	VIDI2	U	U	U	C, U	C	.	.	.
.	.	.	.	7199	Chinese chastetree	Vitex	negundo	VINE2	U	U	U	U	.	.	U	.
.	.	.	.	8874	smallflower chastetree	Vitex	parviflora	VIPA6	U	P, U	U	U	.	P	.	.
.	.	.	.	8876	simpleleaf chastetree	Vitex	trifolia	VITR7	U	P, U	U	U	.	P	.	.
.	.	.	.	8881	Wallenia lamarckiana	Wallenia	lamarckiana	WALA	U	U	U	C, U	C	.	.	.
.	.	.	.	8883	California fan palm	Washingtonia	filifera	WAFI	U	U	U	U	.	.	U	.
.	.	.	.	8885	Washington fan palm	Washingtonia	robusta	WARO	U	U	U	U	.	.	U	.
.	.	.	.	8886	Weinmannia affinis	Weinmannia	affinis	WEAF	U	P, U	U	U	.	P	.	.
.	.	.	.	8887	bastard briziletto	Weinmannia	pinnata	WEPI	U	U	U	C, U	C	.	.	.
.	.	.	.	8889	alpine false ohelo	Wikstroemia	bicornuta	WIBI	U	P, U	U	U	.	P	.	.
.	.	.	.	8890	forest false ohelo	Wikstroemia	furcata	WIFU	U	P, U	U	U	.	P	.	.
.	.	.	.	8891	montane false ohelo	Wikstroemia	monticola	WIMO	U	P, U	U	U	.	P	.	.
.	.	.	.	8892	Oahu false ohelo	Wikstroemia	oahuensis	WIOA	U	P, U	U	U	.	P	.	.
.	.	.	.	8895	Hawaii false ohelo	Wikstroemia	phillyreifolia	WIPH2	U	P, U	U	U	.	P	.	.
.	.	.	.	8896	Kohala false ohelo	Wikstroemia	pulcherrima	WIPU	U	P, U	U	U	.	P	.	.
.	.	.	.	8897	variableleaf false ohelo	Wikstroemia	sandwicensis	WISA	U	P, U	U	U	.	P	.	.
.	.	.	.	8898	Skottsbergs false ohelo	Wikstroemia	skottsbergiana	WISK	U	P, U	U	U	.	P	.	.
.	.	.	.	8899	false ohelo	Wikstroemia	spp.	WIKST	U	P, U	U	U	.	P	.	.
.	.	.	.	8900	hairy false ohelo	Wikstroemia	villosa	WIVI	U	P, U	U	U	.	P	.	.
.	.	.	.	8901	tallow wood	Ximenia	americana	XIAM	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8903	lalanyog	Xylocarpus	granatum	XYGR	U	P, U	U	U	.	P	.	.
.	.	.	.	8904	leilei	Xylocarpus	moluccensis	XYMO2	U	P, U	U	U	.	P	.	.

Non-Urban Exclu-sion	NFS Region Exclu-sion	Main-land Exclu-sion	Wood land	FIA Code	Common Name	Genus	Species[4]	PLANTS Code	Past NRS Tally	Past PNW Tally	Past RMRS Tally	Past SRS Tally	Carib bean	Pacific	Urban	Historic P2
.	.	.	.	8906	mucha-gente	Xylosma	buxifolia	XYBU	U	U	U	C, U	C	.	.	.
.	.	.	.	8902	dense logwood	Xylosma	congestum	XYCO7	U	U	U	U	.	.	U	.
.	.	.	.	8907	sawtooth logwood	Xylosma	crenata	XYCR	U	P, U	U	U	.	P	.	.
.	.	.	.	8908	Hawaii brushholly	Xylosma	hawaiiensis	XYHA	U	P, U	U	U	.	P	.	.
.	.	.	.	8909	Xylosma nelsonii	Xylosma	nelsonii	XYNE2	U	P, U	U	U	.	P	.	.
.	.	.	.	8910	spiny logwood	Xylosma	pachyphylla	XYPA2	U	U	U	C, U	C	.	.	.
.	.	.	.	8911	Xylosma samoensis	Xylosma	samoensis	XYSA	U	P, U	U	U	.	P	.	.
.	.	.	.	8912	white logwood	Xylosma	schaefferioides	XYSC2	U	U	U	C, U	C	.	.	.
.	.	.	.	8913	Schwaneck's logwood	Xylosma	schwaneckeana	XYSC3	U	U	U	C, U	C	.	.	.
.	.	.	.	8916	aloe yucca	Yucca	aloifolia	YUAL	U	U	U	C, U	C	.	.	.
.	.	.	.	8917	Eve's needle	Yucca	faxoniana	YUFA	U	U	U	U	.	.	U	.
.	.	.	.	8918	moundlily yucca	Yucca	gloriosa	YUGL2	U	U	U	C, U	C	.	.	.
.	.	.	.	8919	bluestem yucca	Yucca	guatemalensis	YUGU	U	U	U	C, U	C	.	.	.
.	.	.	.	8923	Maricao pricklyash	Zanthoxylum	bifoliolatum	ZABI	U	U	U	C, U	C	.	.	.
.	.	.	.	8924	prickly yellow	Zanthoxylum	caribaeum	ZACA3	U	U	U	C, U	C	.	.	.
.	.	.	.	8925	kawau	Zanthoxylum	dipetalum	ZADI	U	P, U	U	U	.	P	.	.
.	.	.	.	8928	West Indian satinwood	Zanthoxylum	flavum	ZAFL	U	U	U	C, U	C	.	.	.
.	.	.	.	8929	Hawaii pricklyash	Zanthoxylum	hawaiiense	ZAHA	U	P, U	U	U	.	P	.	.
.	.	.	.	8930	Kauai pricklyash	Zanthoxylum	kauaense	ZAKA	U	P, U	U	U	.	P	.	.
.	.	.	.	8931	white pricklyash	Zanthoxylum	martinicense	ZAMA	U	U	U	C, U	C	.	.	.
.	.	.	.	8932	yellow prickle	Zanthoxylum	monophyllum	ZAMO	U	U	U	C, U	C	.	.	.
.	.	.	.	8933	Oahu pricklyash	Zanthoxylum	oahuense	ZAOA	U	P, U	U	U	.	P	.	.
.	.	.	.	8934	dotted pricklyash	Zanthoxylum	punctatum	ZAPU2	U	U	U	C, U	C	.	.	.
.	.	.	.	8935	niaragato	Zanthoxylum	spinifex	ZASP	U	U	U	C, U	C	.	.	.
.	.	.	.	8937	St. Thomas pricklyash	Zanthoxylum	thomasianum	ZATH	U	U	U	C, U	C	.	.	.
.	.	.	.	8938	Zapoteca portoricensis	Zapoteca	portoricensis	ZAPO2	U	U	U	C, U	C	.	.	.
.	.	.	.	7243	Japanese zelkova	Zelkova	serrata	ZESE80	U	U	U	U	.	.	U	.
.	.	.	.	8939	Indian jujube	Ziziphus	mauritiana	ZIMA	U	P, U	U	C, U	C	P	.	.
.	.	.	.	8940	cacao rojo	Ziziphus	reticulata	ZIRE	U	U	U	C, U	C	.	.	.
.	.	.	.	8941	soana	Ziziphus	rignonii	ZIRI	U	U	U	C, U	C	.	.	.
.	.	.	.	8943	Taylor's jujube	Ziziphus	taylorii	ZITA	U	U	U	C, U	C	.	.	.

Appendix 4. Was previously: Site Tree Selection Criteria and Species List **(This information is now located in 7.2.2 SPECIES)**

Appendix 5. Determination of Stocking Values for Land Use Classification

(This appendix is left in the field guide to assist in determining FOREST TYPE and STAND SIZE CLASS.)

Stocking values are required to determine if a CONDITION CLASS STATUS = 1 (accessible forest land) exists on a plot. This will determine which data items must be recorded for the condition. When the CONDITION CLASS STATUS is in question (usually a nonforest area that is in the process of reverting to forest land or a marginal site that can only support a low number of trees), the crew must determine if there is sufficient stocking to classify the condition as forest. A minimum stocking value of 10 percent is required for accessible forest land (unless the condition was previously forested, such as a recent clearcut).

The following tables show the stocking values to assign to trees or the number of trees per acre to determine if a plot meets the minimum stocking to be considered forest land. In the determination of stocking for this purpose, the field crew should consider the condition over its entire area, not just the trees and seedlings that would be tallied on the subplots and microplots, especially when the plot straddles conditions. Also, for stocking purposes, consider a clump of trees (e.g., stump sprouts) less than 5 inches DBH to be a single tree.

The number of trees per acre needed to obtain minimum stocking depends on the DBH of the largest tree on the plot in the condition being evaluated, and the species and DBH of each of the tally trees. If the condition occurs on all four subplots and the trees are distributed fairly evenly over the entire condition area, the following steps can be used to determine if the condition has the minimum number of trees per acre for forest land.

Observe all of the trees on the plot and classify the condition, based on the tree with the largest DBH, into one of the following groups; the largest tree observed has a DBH of 5 inches or greater, 4.0-4.9 inches, 3.0-3.9 inches, 2.0-2.9 inches, 1.0-1.9 inches or less than 1.0 inch DBH. If you are using the *Stocking Values* table to determine if the condition meets minimum stocking, use table 5a, 5b, 5c, 5d, 5e, or 5f. If you are using the *Number of Trees* table to determine if the condition meets minimum stocking, use table 5g.

When using a *Stocking Values* table, begin a tally of each subplot and microplot and sum the stocking values for each tree tallied based upon its species and size class. When the stocking values for the tallied trees equals or exceeds 10, the condition meets the minimum stocking requirement for forest land.

For example, a condition that was formerly nonforest is no longer being maintained as nonforest and has begun to revert. A check of all four subplots and microplots confirms that the largest tree there is in the 3.0 – 3.9 inches DBH class. The tally of microplot 1 is one red maple (species code = 316) seedling. The sum of the stocking value (table 5a) to this point is 2.4 and the tally continues on microplot 2.

Subplot Number	Plot Type	Species	Size Class	Number Tallied	Stocking Value
1	2	316	< 1.0	1	2.4
Total					2.4

The tally at microplot 2 is two red maple seedlings. The stocking value for the two seedlings is 4.8. The cumulative stocking value to this point is 7.2. Since the minimum value of 10 percent stocking has not been reached, the tally continues to subplot 3.

Subplot Number	Plot Type	Species	Size Class	Number Tallied	Stocking Value
1	2	316	< 1.0	1	2.4
2	2	316	< 1.0	2	4.8
Total					7.2

At microplot 3 one sugar maple (species code = 318) sapling in the 1.0 – 1.9-inch DBH class is tallied. The cumulative stocking value is now 13.1 and the condition meets the minimum stocking to be considered forest land.

Subplot Number	Plot Type	Species	Size Class	Number Tallied	Stocking Value
1	2	316	< 1.0	1	2.4
2	2	316	< 1.0	2	4.8
3	2	318	1.0 – 1.9	1	5.9
Total					13.1

When trees of more than one diameter class are present, their contribution towards meeting the minimum must be combined. For example:

> In a lodgepole pine stand (species code = 108), the largest tree in the condition is 5.0+ inches DBH. If at least 20 trees that are 5.0-6.9 inches DBH are found on the four subplots, the minimum stocking of 10 percent (table 5b: 5th row, 1st column) is met. In the same condition only 5 tally trees in the 13.0-14.9-inch DBH class are needed to meet minimum stocking of 10 percent. If the tally were three 5.0-6.9-inch trees and two 13.0-14.9-inch DBH class trees (total stocking of 3 x 0.5 + 2 x 2.2 = 5.9), the combined stocking would not meet the minimum 10 percent (5.9 < 10) and the condition would be classified nonforest.

When using the *Number of Trees* table (table 5g), estimate the number of trees per acre by the diameter classes. When a condition exists on all 4 of the 24-ft radius subplots, each tally tree (DBH $\geq$ 5.0 inches) represents 6 trees per acre and each sapling (DBH $\geq$ 1.0 inch to < 5.0 inches) or seedling observed on the 4 microplots represents 75 trees per acre.

In sparse stands of smaller trees, a more accurate observation of trees per acre can be determined by observing trees < 5.0 inches DBH on the 24-ft radius subplot. In many forest types no more than 180 trees per acre of the largest diameter class are needed to meet the minimum stocking requirements, a total of 30 trees on all 4 subplots, 7 or 8 smaller trees on each subplot, will provide minimum stocking.

Other things observed on the plot will influence the determination of condition class status. In the last lodgepole pine example, evidence of a recent disturbance that reduced the stocking (cutting, fire, etc.) should be considered. Also, a very uneven distribution of the trees across the condition can greatly change the observed number of trees per acre on plots installed across the condition.

If the condition does not cover all four subplots entirely, trees per acre must be expanded using an expansion factor. The expansion factor is equal to 400/sum of the percent of subplot area (%ARE) for the condition. The trees per acre value of every diameter class is multiplied by this expansion factor.

If the trees are not uniformly distributed throughout the condition or the condition occurs on only a small portion of the plot (half the plot or less), use your best judgment in assigning status. You may place

several additional temporary subplots in the condition in order to get a larger sample to base stocking on. When additional temporary subplots or judgment is used to assign land use, a note should be made on the plot sheet. Use the following procedure to establish these temporary subplots in a condition:

A. Consider locations 120.0 feet horizontal distance from the highest numbered subplot in the condition. First consider the location 0° azimuth from the subplot center. If this location is unsuitable, consider in order locations at azimuth 120°, and 240°. When a suitable location has been found, establish the temporary subplot. Temporary subplots should be entirely within the condition (locations should not be within 24.0 feet of a mapped boundary).

B. If Step A fails to yield a suitable subplot location, repeat Step A at each of the next highest-numbered regular subplots in the condition.

C. If Steps A and B have been exhausted and a suitable temporary subplot still has not been found, repeat Step A at each temporary subplot in turn, beginning with the first temporary subplot that was established.

If more than one temporary subplot is to be established, repeat Steps A and B to establish the second lowest- numbered temporary subplot next, and continue in order until you have enough temporary subplots established in the condition to get a good, representative estimate of stocking. The general rule for establishing temporary subplots is:

- Install the lowest temporary subplot off the highest established subplot, until all the established subplots have been exhausted.
- Then establish the lowest temporary subplot yet to be established off the lowest one already established (lowest off highest, then lowest off lowest).

If there is a transition zone between two conditions use your best judgment to be sure that trees tallied in the transition zone do not have too much weight in the assignment of a land use.

Table 5a. Stocking values for all tallied trees on the four subplots and microplots

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	0.7	6.9	5.2	4.0	2.6	1.2	7.9	6.2	4.6	3.0	1.4	7.6	5.7	3.7	1.8	7.4	4.9	2.3	7.2	3.5	7.0
72, 73, 844	0.6	5.6	4.3	3.3	2.1	1.0	6.4	5.1	3.8	2.5	1.1	6.3	4.6	3.0	1.4	6.1	4.0	1.9	5.9	2.9	5.7
57, 61, 95	0.7	6.2	4.7	3.6	2.3	1.1	7.1	5.6	4.2	2.7	1.3	6.9	5.1	3.3	1.6	6.7	4.4	2.1	6.5	3.2	6.3
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	1.0	9.1	6.9	5.3	3.4	1.6	10.4	8.3	6.1	4.0	1.9	10.1	7.5	4.9	2.3	9.9	6.5	3.1	9.6	4.7	9.3
108	0.5	5.0	3.7	2.9	1.9	0.8	5.7	4.5	3.3	2.2	1.0	5.5	4.1	2.7	1.3	5.4	3.5	1.7	5.2	2.5	5.1
110	0.8	7.3	5.5	4.3	2.7	1.2	8.3	6.6	4.9	3.2	1.5	8.1	6.0	3.9	1.9	7.9	5.2	2.5	7.6	3.7	7.4
111	0.8	7.8	5.9	4.6	3.0	1.3	8.9	7.1	5.3	3.4	1.6	8.7	6.5	4.2	2.0	8.5	5.6	2.7	8.2	4.0	8.0
103, 104, 119	0.4	4.2	3.1	2.4	1.6	0.7	4.7	3.8	2.8	1.8	0.8	4.6	3.4	2.2	1.1	4.5	2.9	1.4	4.4	2.1	4.2
121	1.1	10.1	7.6	5.9	3.8	1.7	11.5	9.1	6.8	4.4	2.1	11.2	8.3	5.4	2.6	10.9	7.2	3.4	10.6	5.1	10.3
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	0.5	5.0	3.8	2.9	1.9	0.9	5.7	4.6	3.4	2.2	1.0	5.6	4.1	2.7	1.3	5.4	3.6	1.7	5.3	2.6	5.1
125, 136	0.7	6.8	5.1	4.0	2.6	1.2	7.7	6.1	4.6	3.0	1.4	7.5	5.6	3.7	1.7	7.3	4.8	2.3	7.1	3.5	6.9
128	1.1	10.2	7.7	5.9	3.8	1.7	11.6	9.2	6.8	4.5	2.1	11.3	8.4	5.5	2.6	11.0	7.2	3.5	10.7	5.2	10.4

Table 5a. Stocking values for all tallied trees on the four subplots and microplots

	DBH of the largest tally tree in the condition																				
	5.0+						**4.0-4.9**					**3.0-3.9**				**2.0-2.9**			**1.0-1.9**		**Seedling**
	DBH of tally tree						**DBH of tally tree**					**DBH of tally tree**				**DBH of tally tree**			**DBH of tally tree**		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
129	0.8	7.5	5.7	4.4	2.8	1.3	8.6	6.8	5.1	3.3	1.5	8.4	6.2	4.1	1.9	8.1	5.3	2.6	7.9	3.8	7.7
131	0.9	8.3	6.3	4.8	3.1	1.4	9.4	7.5	5.6	3.6	1.7	9.2	6.8	4.5	2.1	8.9	5.9	2.8	8.7	4.2	8.4
15, 200, 201, 202, 510, 511, 512, 513, 514	0.7	6.8	5.1	4.0	2.6	1.2	7.7	6.2	4.6	3.0	1.4	7.5	5.6	3.7	1.7	7.3	4.8	2.3	7.1	3.5	6.9
43, 241	0.7	6.1	4.6	3.6	2.3	1.0	6.9	5.5	4.1	2.7	1.2	6.8	5.0	3.3	1.6	6.6	4.3	2.1	6.4	3.1	6.2
240, 260, 261, 262	0.8	7.7	5.8	4.5	2.9	1.3	8.7	7.0	5.2	3.4	1.6	8.5	6.3	4.1	2.0	8.3	5.4	2.6	8.0	3.9	7.8
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	0.5	4.8	3.6	2.8	1.8	0.8	5.4	4.3	3.2	2.1	1.0	5.3	3.9	2.6	1.2	5.1	3.4	1.6	5.0	2.4	4.8
211, 212	0.4	3.8	2.9	2.2	1.4	0.6	4.3	3.4	2.5	1.7	0.8	4.2	3.1	2.0	1.0	4.1	2.7	1.3	4.0	1.9	3.8

Table 5a. Stocking values for all tallied trees on the four subplots and microplots

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	1.0	9.6	7.2	5.6	3.6	1.6	10.9	8.7	6.4	4.2	2.0	10.6	7.9	5.2	2.4	10.3	6.8	3.3	10.0	4.9	9.8

Table 5a. Stocking values for all tallied trees on the four subplots and microplots

	DBH of the largest tally tree in the condition																				
	5.0+						**4.0-4.9**					**3.0-3.9**				**2.0-2.9**			**1.0-1.9**		**Seedling**
	DBH of tally tree						**DBH of tally tree**					**DBH of tally tree**				**DBH of tally tree**			**DBH of tally tree**		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
350, 351, 352, 353, 355, 492	1.3	11.7	8.8	6.8	4.4	2.0	13.3	10.6	7.9	5.1	2.4	13.0	9.6	6.3	3.0	12.6	8.3	4.0	12.3	5.9	11.9
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	1.2	10.9	8.2	6.3	4.1	1.8	12.4	9.8	7.3	4.8	2.2	12.1	9.0	5.9	2.8	11.7	7.7	3.7	11.4	5.5	11.1
373, 374, 375, 378, 379	1.1	10.5	7.9	6.1	4.0	1.8	12.0	9.5	7.1	4.6	2.1	11.6	8.7	5.7	2.7	11.3	7.4	3.6	11.0	5.3	10.7
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	1.2	11.6	8.8	6.8	4.4	2.0	13.2	10.5	7.8	5.1	2.4	12.9	9.6	6.3	3.0	12.5	8.2	3.9	12.2	5.9	11.8

Table 5a. Stocking values for all tallied trees on the four subplots and microplots

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
600, 601, 602, 603, 604, 605, 606	1.4	12.7	9.6	7.4	4.8	2.2	14.5	11.5	8.5	5.6	2.6	14.1	10.5	6.9	3.2	13.7	9.0	4.3	13.3	6.5	12.9
220, 221, 222, 611, 690, 691, 692, 693, 694	0.7	6.8	5.2	4.0	2.6	1.2	7.8	6.2	4.6	3.0	1.4	7.6	5.6	3.7	1.7	7.4	4.9	2.3	7.2	3.5	7.0
741, 743, 746	1.2	10.9	8.3	6.4	4.1	1.9	12.5	9.9	7.3	4.8	2.2	12.1	9.0	5.9	2.8	11.8	7.8	3.7	11.5	5.6	11.1
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	1.0	9.3	7.0	5.4	3.5	1.6	10.6	8.4	6.3	4.1	1.9	10.3	7.7	5.0	2.4	10.0	6.6	3.2	9.8	4.7	9.5
950, 951, 952, 953	1.0	9.2	7.0	5.4	3.5	1.6	10.5	8.4	6.2	4.0	1.9	10.2	7.6	5.0	2.3	10.0	6.5	3.1	9.7	4.7	9.4
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	1.2	10.8	8.1	6.3	4.1	1.8	12.3	9.8	7.2	4.7	2.2	12.0	8.9	5.8	2.7	11.6	7.6	3.7	11.3	5.5	11.0

Table 5b. Stocking values for all trees tallied on the subplot only

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	0.7	1.1	1.6	2.1	2.6	3.2	3.8	4.4	5.1	5.8	6.5	7.2	8.0
72, 73, 844	0.6	1.0	1.5	2.0	2.6	3.3	4.0	4.9	5.7	6.7	7.6	8.7	9.8
57, 61, 95	0.7	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1	3.4	3.6
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	1.0	1.5	2.2	3.0	3.8	4.7	5.6	6.6	7.7	8.9	10.1	11.4	12.7
108	0.5	0.9	1.3	1.7	2.2	2.8	3.4	4.1	4.8	5.6	6.4	7.3	8.2
110	0.8	1.3	2.0	2.7	3.6	4.6	5.7	6.9	8.2	9.6	11.1	12.7	14.4
111	0.8	1.5	2.2	3.2	4.2	5.5	6.9	8.4	10.1	11.9	13.9	16.0	18.2
103, 104, 119	0.4	0.7	1.1	1.5	1.9	2.4	3.0	3.6	4.2	4.9	5.6	6.4	7.2
121	1.1	1.6	2.3	2.9	3.7	4.4	5.3	6.1	7.0	8.0	8.9	10.0	11.0
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	0.5	1.0	1.5	2.2	2.9	3.8	4.9	6.0	7.3	8.6	10.1	11.8	13.5
125, 136	0.7	1.2	1.7	2.3	3.0	3.7	4.6	5.4	6.4	7.4	8.4	9.5	10.7
128	1.1	1.8	2.6	3.5	4.5	5.6	6.8	8.2	9.6	11.1	12.7	14.3	16.1
129	0.8	1.2	1.7	2.3	2.9	3.6	4.2	5.0	5.7	6.6	7.4	8.3	9.2
131	0.9	1.5	2.1	2.9	3.8	4.8	5.9	7.1	8.3	9.7	11.1	12.6	14.2
15, 200, 201, 202, 510, 511, 512, 513, 514	0.7	1.1	1.6	2.1	2.7	3.3	4.0	4.7	5.4	6.2	7.0	7.8	8.7
43, 241	0.7	1.1	1.6	2.3	3.0	3.8	4.7	5.7	6.8	7.9	9.2	10.5	11.8
240, 260, 261, 262	0.8	1.5	2.4	3.6	4.9	6.5	8.4	10.4	12.8	15.3	18.2	21.2	24.6
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	0.5	0.8	1.2	1.6	2.1	2.6	3.2	3.8	4.5	5.2	5.9	6.7	7.5
211, 212	0.4	0.7	1.0	1.3	1.7	2.1	2.6	3.1	3.6	4.2	4.8	5.4	6.1

Table 5b. Stocking values for all trees tallied on the subplot only

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	1.0	1.6	2.2	3.0	3.8	4.6	5.5	6.5	7.5	8.6	9.7	10.9	12.1
350, 351, 352, 353, 355, 492	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.8	7.8	8.9	9.9	11.0	12.1
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	1.2	2.0	3.0	4.2	5.6	7.2	9.0	11.0	13.1	15.4	17.8	20.5	23.3
373, 374, 375, 378, 379	1.1	1.9	3.0	4.2	5.6	7.2	9.0	11.0	13.1	15.5	18.0	20.7	23.6
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	1.2	2.0	2.9	3.9	5.0	6.2	7.5	8.9	10.4	11.9	13.6	15.3	17.2
600, 601, 602, 603, 604, 605, 606	1.4	2.1	2.9	3.9	4.9	5.9	7.1	8.3	9.6	10.9	12.3	13.7	15.2
220, 221, 222, 611, 690, 691, 692, 693, 694	0.7	1.3	1.9	2.7	3.6	4.6	5.7	7.0	8.3	9.8	11.4	13.1	14.9
741, 743, 746	1.2	1.8	2.5	3.2	4.0	4.9	5.8	6.8	7.8	8.9	10.0	11.1	12.3
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	1.0	1.4	1.8	2.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.7	6.2
950, 951, 952, 953	1.0	1.8	2.8	4.0	5.5	7.2	9.1	11.3	13.7	16.3	19.1	22.2	25.5
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	1.2	2.0	3.0	4.2	5.6	7.2	8.9	10.9	13.0	15.2	17.7	20.3	23.1

Table 5c. Stocking values for all trees < 7 inches, observed on the four subplots only

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	0.74	0.55	0.42	0.32	0.21	0.09	0.63	0.50	0.37	0.24	0.11	0.61	0.45	0.30	0.14	0.59	0.39	0.19	0.58	0.28	0.56
72, 73, 844	0.60	0.45	0.34	0.26	0.17	0.08	0.51	0.41	0.30	0.20	0.09	0.50	0.37	0.24	0.11	0.49	0.32	0.15	0.47	0.23	0.46
57, 61, 95	0.67	0.50	0.38	0.29	0.19	0.08	0.57	0.45	0.33	0.22	0.10	0.55	0.41	0.27	0.13	0.54	0.35	0.17	0.52	0.25	0.51
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	0.98	0.73	0.55	0.43	0.28	0.12	0.83	0.66	0.49	0.32	0.15	0.81	0.60	0.39	0.19	0.79	0.52	0.25	0.77	0.37	0.74
108	0.53	0.40	0.30	0.23	0.15	0.07	0.45	0.36	0.27	0.17	0.08	0.44	0.33	0.21	0.10	0.43	0.28	0.13	0.42	0.20	0.40
110	0.78	0.58	0.44	0.34	0.22	0.10	0.66	0.53	0.39	0.26	0.12	0.65	0.48	0.31	0.15	0.63	0.41	0.20	0.61	0.30	0.59
111	0.84	0.63	0.47	0.37	0.24	0.11	0.72	0.57	0.42	0.27	0.13	0.70	0.52	0.34	0.16	0.68	0.45	0.21	0.66	0.32	0.64
103, 104, 119	0.45	0.33	0.25	0.19	0.13	0.06	0.38	0.30	0.22	0.15	0.07	0.37	0.27	0.18	0.08	0.36	0.24	0.11	0.35	0.17	0.34
121	1.08	0.81	0.61	0.47	0.30	0.14	0.92	0.73	0.54	0.35	0.16	0.90	0.67	0.44	0.21	0.87	0.57	0.27	0.85	0.41	0.82
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	0.54	0.40	0.30	0.24	0.15	0.07	0.46	0.36	0.27	0.18	0.08	0.45	0.33	0.22	0.10	0.43	0.29	0.14	0.42	0.20	0.41
125, 136	0.73	0.54	0.41	0.32	0.20	0.09	0.62	0.49	0.36	0.24	0.11	0.60	0.45	0.29	0.14	0.59	0.39	0.18	0.57	0.28	0.55

Table 5c. Stocking values for all trees < 7 inches, observed on the four subplots only

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
128	1.09	0.81	0.62	0.48	0.31	0.14	0.93	0.74	0.55	0.36	0.17	0.90	0.67	0.44	0.21	0.88	0.58	0.28	0.85	0.41	0.83
129	0.81	0.60	0.46	0.35	0.23	0.10	0.69	0.55	0.40	0.26	0.12	0.67	0.50	0.33	0.15	0.65	0.43	0.20	0.63	0.31	0.61
131	0.89	0.66	0.50	0.39	0.25	0.11	0.76	0.60	0.45	0.29	0.14	0.74	0.55	0.36	0.17	0.72	0.47	0.23	0.70	0.34	0.68
15, 200, 201, 202, 510, 511, 512, 513, 514	0.73	0.54	0.41	0.32	0.20	0.09	0.62	0.49	0.36	0.24	0.11	0.60	0.45	0.29	0.14	0.59	0.39	0.18	0.57	0.28	0.55
43, 241	0.65	0.49	0.37	0.28	0.18	0.08	0.56	0.44	0.33	0.21	0.10	0.54	0.40	0.26	0.12	0.53	0.35	0.17	0.51	0.25	0.50
240, 260, 261, 262	0.82	0.61	0.46	0.36	0.23	0.10	0.70	0.56	0.41	0.27	0.13	0.68	0.51	0.33	0.16	0.66	0.44	0.21	0.64	0.31	0.63
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	0.51	0.38	0.29	0.22	0.14	0.06	0.43	0.34	0.26	0.17	0.08	0.42	0.31	0.21	0.10	0.41	0.27	0.13	0.40	0.19	0.39
211, 212	0.41	0.30	0.23	0.18	0.11	0.05	0.34	0.27	0.20	0.13	0.06	0.34	0.25	0.16	0.08	0.33	0.21	0.10	0.32	0.15	0.31

Table 5c. Stocking values for all trees < 7 inches, observed on the four subplots only

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	1.03	0.77	0.58	0.45	0.29	0.13	0.87	0.69	0.52	0.34	0.16	0.85	0.63	0.41	0.20	0.83	0.54	0.26	0.80	0.39	0.78

Table 5c. Stocking values for all trees < 7 inches, observed on the four subplots only

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
350, 351, 352, 353, 355, 492	1.25	0.93	0.71	0.55	0.35	0.16	1.07	0.85	0.63	0.41	0.19	1.04	0.77	0.50	0.24	1.01	0.66	0.32	0.98	0.48	0.95
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	1.17	0.87	0.66	0.51	0.33	0.15	0.99	0.79	0.58	0.38	0.18	0.96	0.72	0.47	0.22	0.94	0.62	0.30	0.91	0.44	0.89
373, 374, 375, 378, 379	1.13	0.84	0.63	0.49	0.32	0.14	0.96	0.76	0.56	0.37	0.17	0.93	0.69	0.45	0.21	0.91	0.60	0.28	0.88	0.43	0.85
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	1.25	0.93	0.70	0.54	0.35	0.16	1.06	0.84	0.62	0.41	0.19	1.03	0.77	0.50	0.24	1.00	0.66	0.32	0.97	0.47	0.95

Table 5c. Stocking values for all trees < 7 inches, observed on the four subplots only

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
600, 601, 602, 603, 604, 605, 606	1.36	1.01	0.77	0.59	0.38	0.17	1.16	0.92	0.68	0.44	0.21	1.13	0.84	0.55	0.26	1.10	0.72	0.34	1.07	0.52	1.03
220, 221, 222, 611, 690, 691, 692, 693, 694	0.73	0.55	0.41	0.32	0.21	0.09	0.62	0.50	0.37	0.24	0.11	0.61	0.45	0.30	0.14	0.59	0.39	0.19	0.57	0.28	0.56
741, 743, 746	1.17	0.87	0.66	0.51	0.33	0.15	1.00	0.79	0.59	0.38	0.18	0.97	0.72	0.47	0.22	0.94	0.62	0.30	0.92	0.45	0.89
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	1.00	0.74	0.56	0.43	0.28	0.13	0.85	0.67	0.50	0.33	0.15	0.83	0.61	0.40	0.19	0.80	0.53	0.25	0.78	0.38	0.76
950, 951, 952, 953	0.99	0.74	0.56	0.43	0.28	0.13	0.84	0.67	0.50	0.32	0.15	0.82	0.61	0.40	0.19	0.80	0.52	0.25	0.77	0.38	0.75
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	1.16	0.86	0.65	0.50	0.32	0.15	0.98	0.78	0.58	0.38	0.18	0.96	0.71	0.47	0.22	0.93	0.61	0.29	0.90	0.44	0.88

Table 5d. Stocking values for all trees 5.0 inches and greater observed on the four subplots only

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	0.7	1.1	1.6	2.1	2.6	3.2	3.8	4.4	5.1	5.8	6.5	7.2	8.0
72, 73, 844	0.6	1.0	1.5	2.0	2.6	3.3	4.0	4.9	5.7	6.7	7.6	8.7	9.8
57, 61, 95	0.7	0.9	1.1	1.4	1.6	1.9	2.1	2.4	2.6	2.9	3.1	3.4	3.6
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	1.0	1.5	2.2	3.0	3.8	4.7	5.6	6.6	7.7	8.9	10.1	11.4	12.7
108	0.5	0.9	1.3	1.7	2.2	2.8	3.4	4.1	4.8	5.6	6.4	7.3	8.2
110	0.8	1.3	2.0	2.7	3.6	4.6	5.7	6.9	8.2	9.6	11.1	12.7	14.4
111	0.8	1.5	2.2	3.2	4.2	5.5	6.9	8.4	10.1	11.9	13.9	16.0	18.2
103, 104, 119	0.4	0.7	1.1	1.5	1.9	2.4	3.0	3.6	4.2	4.9	5.6	6.4	7.2
121	1.1	1.6	2.3	2.9	3.7	4.4	5.3	6.1	7.0	8.0	8.9	10.0	11.0
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	0.5	1.0	1.5	2.2	2.9	3.8	4.9	6.0	7.3	8.6	10.1	11.8	13.5
125, 136	0.7	1.2	1.7	2.3	3.0	3.7	4.6	5.4	6.4	7.4	8.4	9.5	10.7
128	1.1	1.8	2.6	3.5	4.5	5.6	6.8	8.2	9.6	11.1	12.7	14.3	16.1
129	0.8	1.2	1.7	2.3	2.9	3.6	4.2	5.0	5.7	6.6	7.4	8.3	9.2
131	0.9	1.5	2.1	2.9	3.8	4.8	5.9	7.1	8.3	9.7	11.1	12.6	14.2
15, 200, 201, 202, 510, 511, 512, 513, 514	0.7	1.1	1.6	2.1	2.7	3.3	4.0	4.7	5.4	6.2	7.0	7.8	8.7
43, 241	0.7	1.1	1.6	2.3	3.0	3.8	4.7	5.7	6.8	7.9	9.2	10.5	11.8
240, 260, 261, 262	0.8	1.5	2.4	3.6	4.9	6.5	8.4	10.4	12.8	15.3	18.2	21.2	24.6
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	0.5	0.8	1.2	1.6	2.1	2.6	3.2	3.8	4.5	5.2	5.9	6.7	7.5
211, 212	0.4	0.7	1.0	1.3	1.7	2.1	2.6	3.1	3.6	4.2	4.8	5.4	6.1

Table 5d. Stocking values for all trees 5.0 inches and greater observed on the four subplots only

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	1.0	1.6	2.2	3.0	3.8	4.6	5.5	6.5	7.5	8.6	9.7	10.9	12.1
350, 351, 352, 353, 355, 492	1.3	1.9	2.6	3.3	4.1	5.0	5.9	6.8	7.8	8.9	9.9	11.0	12.1
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	1.2	2.0	3.0	4.2	5.6	7.2	9.0	11.0	13.1	15.4	17.8	20.5	23.3
373, 374, 375, 378, 379	1.1	1.9	3.0	4.2	5.6	7.2	9.0	11.0	13.1	15.5	18.0	20.7	23.6
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	1.2	2.0	2.9	3.9	5.0	6.2	7.5	8.9	10.4	11.9	13.6	15.3	17.2
600, 601, 602, 603, 604, 605, 606	1.4	2.1	2.9	3.9	4.9	5.9	7.1	8.3	9.6	10.9	12.3	13.7	15.2
220, 221, 222, 611, 690, 691, 692, 693, 694	0.7	1.3	1.9	2.7	3.6	4.6	5.7	7.0	8.3	9.8	11.4	13.1	14.9
741, 743, 746	1.2	1.8	2.5	3.2	4.0	4.9	5.8	6.8	7.8	8.9	10.0	11.1	12.3
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	1.0	1.4	1.8	2.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.7	6.2
950, 951, 952, 953	1.0	1.8	2.8	4.0	5.5	7.2	9.1	11.3	13.7	16.3	19.1	22.2	25.5
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	1.2	2.0	3.0	4.2	5.6	7.2	8.9	10.9	13.0	15.2	17.7	20.3	23.1

Table 5e. Stocking values for all trees < 7 inches observed on one acre

	DBH of the largest tally tree in the condition																				
	5.0+						**4.0-4.9**					**3.0-3.9**				**2.0-2.9**			**1.0-1.9**		**Seedling**
	DBH of tally tree						**DBH of tally tree**					**DBH of tally tree**				**DBH of tally tree**			**DBH of tally tree**		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	0.12	0.092	0.069	0.054	0.035	0.016	0.105	0.083	0.062	0.040	0.019	0.102	0.076	0.050	0.023	0.099	0.065	0.031	0.096	0.047	0.094
72, 73, 844	0.10	0.075	0.057	0.044	0.028	0.013	0.086	0.068	0.050	0.033	0.015	0.083	0.062	0.041	0.019	0.081	0.053	0.025	0.079	0.038	0.076
57, 61, 95	0.11	0.083	0.063	0.048	0.031	0.014	0.094	0.075	0.056	0.036	0.017	0.092	0.068	0.045	0.021	0.089	0.059	0.028	0.087	0.042	0.084
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	0.16	0.122	0.092	0.071	0.046	0.021	0.139	0.110	0.082	0.053	0.025	0.135	0.100	0.066	0.031	0.131	0.086	0.041	0.128	0.062	0.124
108	0.09	0.066	0.050	0.039	0.025	0.011	0.075	0.060	0.044	0.029	0.013	0.073	0.055	0.036	0.017	0.071	0.047	0.022	0.069	0.034	0.067
110	0.13	0.097	0.073	0.057	0.037	0.016	0.111	0.088	0.065	0.043	0.020	0.108	0.080	0.052	0.025	0.105	0.069	0.033	0.102	0.049	0.099
111	0.14	0.104	0.079	0.061	0.039	0.018	0.119	0.095	0.070	0.046	0.021	0.116	0.086	0.056	0.027	0.113	0.074	0.036	0.110	0.053	0.107
103, 104, 119	0.07	0.055	0.042	0.032	0.021	0.009	0.063	0.050	0.037	0.024	0.011	0.062	0.046	0.030	0.014	0.060	0.039	0.019	0.058	0.028	0.056
121	0.18	0.134	0.102	0.079	0.051	0.023	0.153	0.122	0.090	0.059	0.027	0.149	0.111	0.073	0.034	0.145	0.095	0.046	0.141	0.068	0.137
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	0.09	0.067	0.051	0.039	0.025	0.011	0.077	0.061	0.045	0.029	0.014	0.074	0.055	0.036	0.017	0.072	0.048	0.023	0.070	0.034	0.068
125, 136	0.12	0.090	0.068	0.053	0.034	0.015	0.103	0.082	0.061	0.040	0.018	0.100	0.075	0.049	0.023	0.098	0.064	0.031	0.095	0.046	0.092

Table 5e. Stocking values for all trees < 7 inches observed on one acre

	DBH of the largest tally tree in the condition																				
	5.0+						**4.0-4.9**					**3.0-3.9**				**2.0-2.9**			**1.0-1.9**		**Seedling**
	DBH of tally tree						**DBH of tally tree**					**DBH of tally tree**				**DBH of tally tree**			**DBH of tally tree**		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
128	0.18	0.136	0.103	0.079	0.051	0.023	0.155	0.123	0.091	0.059	0.028	0.151	0.112	0.073	0.035	0.147	0.096	0.046	0.142	0.069	0.138
129	0.13	0.100	0.076	0.059	0.038	0.017	0.114	0.091	0.067	0.044	0.020	0.111	0.083	0.054	0.026	0.108	0.071	0.034	0.105	0.051	0.102
131	0.15	0.110	0.083	0.065	0.042	0.019	0.126	0.100	0.074	0.048	0.023	0.123	0.091	0.060	0.028	0.119	0.078	0.038	0.116	0.056	0.113
15, 200, 201, 202, 510, 511, 512, 513, 514	0.12	0.090	0.068	0.053	0.034	0.015	0.103	0.082	0.061	0.040	0.018	0.100	0.075	0.049	0.023	0.098	0.064	0.031	0.095	0.046	0.092
43, 241	0.11	0.081	0.061	0.047	0.031	0.014	0.093	0.074	0.055	0.036	0.017	0.090	0.067	0.044	0.021	0.088	0.058	0.028	0.085	0.041	0.083
240, 260, 261, 262	0.14	0.102	0.077	0.060	0.039	0.017	0.117	0.093	0.069	0.045	0.021	0.114	0.084	0.055	0.026	0.110	0.073	0.035	0.107	0.052	0.104
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	0.09	0.063	0.048	0.037	0.024	0.011	0.072	0.057	0.043	0.028	0.013	0.070	0.052	0.034	0.016	0.068	0.045	0.022	0.067	0.032	0.065
211, 212	0.07	0.050	0.038	0.029	0.019	0.009	0.057	0.046	0.034	0.022	0.010	0.056	0.042	0.027	0.013	0.054	0.036	0.017	0.053	0.026	0.051

Table 5e. Stocking values for all trees < 7 inches observed on one acre

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	0.17	0.128	0.097	0.075	0.048	0.022	0.146	0.116	0.086	0.056	0.026	0.142	0.105	0.069	0.033	0.138	0.091	0.043	0.134	0.065	0.130

Table 5e. Stocking values for all trees < 7 inches observed on one acre

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
350, 351, 352, 353, 355, 492	0.21	0.156	0.118	0.091	0.059	0.026	0.178	0.141	0.105	0.068	0.032	0.173	0.128	0.084	0.040	0.168	0.111	0.053	0.163	0.079	0.159
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	0.19	0.145	0.110	0.085	0.055	0.025	0.165	0.131	0.097	0.063	0.030	0.161	0.120	0.078	0.037	0.156	0.103	0.049	0.152	0.074	0.148
373, 374, 375, 378, 379	0.19	0.140	0.106	0.082	0.053	0.024	0.160	0.127	0.094	0.061	0.028	0.155	0.115	0.076	0.036	0.151	0.099	0.047	0.147	0.071	0.142
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	0.21	0.155	0.117	0.090	0.058	0.026	0.176	0.140	0.104	0.068	0.032	0.172	0.128	0.084	0.039	0.167	0.110	0.053	0.162	0.079	0.158

Table 5e. Stocking values for all trees < 7 inches observed on one acre

	DBH of the largest tally tree in the condition																				
	5.0+						4.0-4.9					3.0-3.9				2.0-2.9			1.0-1.9		Seedling
	DBH of tally tree						DBH of tally tree					DBH of tally tree				DBH of tally tree			DBH of tally tree		
Species	**5.0-6.9**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**4.0-4.9**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**3.0-3.9**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**2.0-2.9**	**1.0-1.9**	**Seed-ling**	**1.0-1.9**	**Seedling**	**Seedling**
600, 601, 602, 603, 604, 605, 606	0.23	0.169	0.128	0.099	0.064	0.029	0.193	0.153	0.114	0.074	0.034	0.188	0.140	0.091	0.043	0.183	0.120	0.057	0.178	0.086	0.172
220, 221, 222, 611, 690, 691, 692, 693, 694	0.12	0.091	0.069	0.053	0.034	0.015	0.104	0.083	0.061	0.040	0.019	0.101	0.075	0.049	0.023	0.098	0.065	0.031	0.096	0.046	0.093
741, 743, 746	0.20	0.146	0.110	0.085	0.055	0.025	0.166	0.132	0.098	0.064	0.030	0.162	0.120	0.079	0.037	0.157	0.103	0.049	0.153	0.074	0.148
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	0.17	0.124	0.094	0.072	0.047	0.021	0.141	0.112	0.083	0.054	0.025	0.138	0.102	0.067	0.032	0.134	0.088	0.042	0.130	0.063	0.126
950, 951, 952, 953	0.16	0.123	0.093	0.072	0.046	0.021	0.140	0.111	0.083	0.054	0.025	0.136	0.101	0.066	0.031	0.133	0.087	0.042	0.129	0.063	0.125
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	0.19	0.143	0.109	0.084	0.054	0.024	0.164	0.130	0.097	0.063	0.029	0.159	0.118	0.078	0.037	0.155	0.102	0.049	0.151	0.073	0.146

Table 5f. Stocking values for all trees 5.0 inches and greater observed on one acre

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	0.12	0.19	0.26	0.34	0.43	0.53	0.63	0.73	0.84	0.96	1.08	1.20	1.33
72, 73, 844	0.10	0.17	0.24	0.33	0.44	0.55	0.67	0.81	0.95	1.11	1.27	1.45	1.63
57, 61, 95	0.11	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.48	0.52	0.56	0.60
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	0.16	0.26	0.37	0.49	0.63	0.78	0.94	1.11	1.29	1.48	1.68	1.89	2.11
108	0.09	0.14	0.21	0.29	0.37	0.47	0.57	0.69	0.81	0.94	1.07	1.22	1.37
110	0.13	0.22	0.33	0.46	0.60	0.77	0.95	1.15	1.37	1.60	1.85	2.12	2.40
111	0.14	0.24	0.37	0.53	0.71	0.91	1.14	1.40	1.68	1.98	2.31	2.66	3.04
103, 104, 119	0.07	0.12	0.18	0.25	0.32	0.41	0.50	0.60	0.70	0.82	0.94	1.07	1.20
121	0.18	0.27	0.38	0.49	0.61	0.74	0.88	1.02	1.17	1.33	1.49	1.66	1.83
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	0.09	0.16	0.25	0.36	0.49	0.64	0.81	1.00	1.21	1.44	1.69	1.96	2.25
125, 136	0.12	0.20	0.28	0.39	0.50	0.62	0.76	0.91	1.06	1.23	1.40	1.59	1.78
128	0.18	0.29	0.43	0.58	0.75	0.94	1.14	1.36	1.60	1.84	2.11	2.39	2.68
129	0.13	0.21	0.29	0.38	0.48	0.59	0.71	0.83	0.96	1.09	1.23	1.38	1.53
131	0.15	0.24	0.36	0.49	0.64	0.80	0.98	1.18	1.39	1.61	1.85	2.10	2.36
15, 200, 201, 202, 510, 511, 512, 513, 514	0.12	0.19	0.27	0.35	0.45	0.55	0.66	0.78	0.90	1.03	1.16	1.30	1.45
43, 241	0.11	0.18	0.27	0.38	0.50	0.64	0.79	0.95	1.13	1.32	1.53	1.74	1.97
240, 260, 261, 262	0.14	0.25	0.40	0.59	0.82	1.09	1.39	1.74	2.13	2.56	3.03	3.54	4.10
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	0.09	0.14	0.20	0.27	0.35	0.44	0.53	0.64	0.75	0.86	0.98	1.11	1.25
211, 212	0.07	0.11	0.16	0.22	0.28	0.35	0.43	0.51	0.60	0.69	0.79	0.90	1.01

Table 5f. Stocking values for all trees 5.0 inches and greater observed on one acre

Species	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	0.17	0.27	0.37	0.49	0.63	0.77	0.92	1.08	1.25	1.43	1.62	1.81	2.01
350, 351, 352, 353, 355, 492	0.21	0.31	0.43	0.56	0.69	0.83	0.98	1.14	1.31	1.48	1.65	1.83	2.02
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	0.19	0.33	0.50	0.71	0.94	1.21	1.50	1.83	2.18	2.56	2.97	3.41	3.88
373, 374, 375, 378, 379	0.19	0.32	0.49	0.70	0.93	1.20	1.50	1.83	2.19	2.58	3.00	3.45	3.93
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	0.21	0.33	0.48	0.64	0.83	1.03	1.24	1.48	1.73	1.99	2.27	2.56	2.86
600, 601, 602, 603, 604, 605, 606	0.23	0.35	0.49	0.64	0.81	0.99	1.18	1.38	1.60	1.82	2.05	2.29	2.54
220, 221, 222, 611, 690, 691, 692, 693, 694	0.12	0.21	0.32	0.45	0.60	0.77	0.95	1.16	1.39	1.63	1.90	2.18	2.48
741, 743, 746	0.20	0.30	0.41	0.54	0.67	0.82	0.97	1.13	1.30	1.48	1.66	1.85	2.05
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	0.17	0.23	0.30	0.36	0.43	0.50	0.58	0.65	0.72	0.80	0.87	0.95	1.03
950, 951, 952, 953	0.16	0.29	0.46	0.67	0.91	1.20	1.52	1.88	2.28	2.71	3.19	3.70	4.26
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	0.19	0.33	0.50	0.70	0.93	1.19	1.49	1.81	2.16	2.54	2.95	3.38	3.85

Table 5g. Minimum number of trees per acre for forest land based on largest tally tree

Species	DBH of largest tally tree																	
	Seed-ling	**1.0-1.9**	**2.0-2.9**	**3.0-3.9**	**4.0-4.9**	**5.0-6.9**	**7.0-8.9**	**9.0-10.9**	**11.0-12.9**	**13.0-14.9**	**15.0-16.9**	**17.0-18.9**	**19.0-20.9**	**21.0-22.9**	**23.0-24.9**	**25.0-26.9**	**27.0-28.9**	**29.0+**
10, 12, 16, 18, 19, 70, 71, 90, 91, 93, 94, 96, 97, 992	106.9	103.8	100.9	98.1	95.5	81.2	53.0	38.1	29.1	23.2	19.0	16.0	13.7	11.9	10.4	9.3	8.3	7.5
72, 73, 844	130.8	127.0	123.4	120.0	116.8	99.3	60.3	41.0	29.9	22.9	18.2	14.8	12.4	10.5	9.0	7.9	6.9	6.1
57, 61, 95	118.7	115.3	112.0	108.9	106.0	90.1	66.6	52.7	43.5	37.0	32.2	28.4	25.5	23.0	21.0	19.3	17.9	16.6
67, 68, 105, 107, 115, 123, 126, 130, 132, 230, 232, 250	80.6	78.3	76.1	74.0	72.0	61.2	38.7	27.2	20.3	15.9	12.9	10.7	9.0	7.8	6.8	5.9	5.3	4.7
108	148.4	144.1	140.0	136.2	132.6	112.7	69.1	47.3	34.7	26.7	21.3	17.4	14.6	12.4	10.7	9.3	8.2	7.3
110	101.0	98.1	95.3	92.7	90.2	76.7	45.6	30.4	21.9	16.5	13.0	10.5	8.7	7.3	6.2	5.4	4.7	4.2
111	93.9	91.2	88.6	86.1	83.8	71.3	41.1	26.9	19.0	14.1	10.9	8.7	7.1	6.0	5.0	4.3	3.8	3.3
103, 104, 119	177.2	172.0	167.2	162.6	158.2	134.5	81.8	55.6	40.5	31.1	24.7	20.1	16.8	14.2	12.2	10.6	9.4	8.3
121	73.0	70.9	68.9	67.0	65.2	55.4	36.6	26.6	20.4	16.4	13.5	11.4	9.8	8.5	7.5	6.7	6.0	5.5
50, 51, 52, 53, 54, 55, 56, 58, 59, 62, 63, 64, 65, 66, 69, 100, 101, 102, 106, 109, 112, 113, 114, 116, 117, 118, 120, 122, 124, 127, 133, 134, 135, 137, 138, 139, 140, 142, 143, 144, 321, 322, 323, 475, 755, 756, 757, 758, 800, 803, 810, 811, 814, 823, 826, 829, 843, 846, 847, 850, 902, 990	146.4	142.1	138.1	134.3	130.7	111.1	62.5	40.0	27.8	20.4	15.6	12.3	10.0	8.3	6.9	5.9	5.1	4.4
125, 136	108.5	105.4	102.4	99.6	96.9	82.4	51.0	35.1	25.9	20.0	16.0	13.2	11.0	9.4	8.1	7.1	6.3	5.6
128	72.3	70.2	68.2	66.4	64.6	54.9	34.0	23.4	17.3	13.3	10.7	8.8	7.4	6.3	5.4	4.7	4.2	3.7
129	97.8	95.0	92.3	89.8	87.4	74.3	48.1	34.3	26.1	20.7	16.9	14.1	12.1	10.4	9.2	8.1	7.3	6.5
131	88.9	86.3	83.9	81.5	79.4	67.5	41.1	28.0	20.5	15.7	12.5	10.2	8.5	7.2	6.2	5.4	4.8	4.2

Table 5g. Minimum number of trees per acre for forest land based on largest tally tree

Species	DBH of largest tally tree																	
	Seed-ling	**1.0-1.9**	**2.0-2.9**	**3.0-3.9**	**4.0-4.9**	**5.0-6.9**	**7.0-8.9**	**9.0-10.9**	**11.0-12.9**	**13.0-14.9**	**15.0-16.9**	**17.0-18.9**	**19.0-20.9**	**21.0-22.9**	**23.0-24.9**	**25.0-26.9**	**27.0-28.9**	**29.0+**
15, 200, 201, 202, 510, 511, 512, 513, 514	108.5	105.3	102.4	99.6	96.9	82.4	52.9	37.5	28.3	22.3	18.2	15.2	12.9	11.1	9.7	8.6	7.7	6.9
43, 241	120.9	117.4	114.1	111.0	108.0	91.8	54.7	36.6	26.4	20.0	15.7	12.7	10.5	8.9	7.6	6.6	5.7	5.1
240, 260, 261, 262	96.0	93.2	90.6	88.1	85.7	72.9	39.7	24.8	16.9	12.2	9.2	7.2	5.7	4.7	3.9	3.3	2.8	2.4
11, 14, 17, 20, 21, 22, 40, 41, 42, 81, 92, 98, 231, 242, 251, 252, 263, 264	154.8	150.3	146.1	142.0	138.2	117.5	72.7	50.1	36.9	28.5	22.8	18.8	15.7	13.4	11.6	10.2	9.0	8.0
211, 212	195.0	189.3	184.0	178.9	174.1	148.0	91.3	62.7	46.2	35.7	28.5	23.4	19.6	16.7	14.4	12.6	11.1	9.9
300, 303, 304, 310, 311, 312, 316, 317, 319, 320, 341, 356, 357, 358, 367, 381, 391, 420, 421, 424, 471, 481, 490, 491, 550, 551, 555, 561, 571, 580, 581, 582, 583, 591, 631, 653, 680, 681, 682, 683, 684, 701, 711, 760, 761, 763, 764, 765, 766, 768, 769, 770, 771, 772, 773, 774, 821, 852, 853, 854, 855, 856, 857, 858, 859, 860, 863, 864, 865, 866, 873, 874, 876, 877, 882, 883, 884, 885, 886, 887, 888, 890, 891, 895, 896, 897, 906, 907, 908, 909, 912, 913, 914, 915, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 934, 935, 936, 937, 940, 982, 986, 987, 988, 989, 991, 994, 995, 996, 997, 999	76.9	74.6	72.5	70.5	68.7	58.4	37.6	26.7	20.2	16.0	13.0	10.9	9.2	8.0	7.0	6.2	5.5	5.0
350, 351, 352, 353, 355, 492	63.0	61.2	59.5	57.8	56.3	47.8	31.9	23.3	18.0	14.5	12.0	10.2	8.8	7.7	6.8	6.1	5.5	4.9

Table 5g. Minimum number of trees per acre for forest land based on largest tally tree

Species	DBH of largest tally tree																	
	Seed-ling	**1.0-1.9**	**2.0-2.9**	**3.0-3.9**	**4.0-4.9**	**5.0-6.9**	**7.0-8.9**	**9.0-10.9**	**11.0-12.9**	**13.0-14.9**	**15.0-16.9**	**17.0-18.9**	**19.0-20.9**	**21.0-22.9**	**23.0-24.9**	**25.0-26.9**	**27.0-28.9**	**29.0+**
314, 315, 318, 330, 331, 332, 333, 334, 336, 337, 370, 371, 372, 377, 450, 451, 452, 531, 552, 712	67.8	65.8	63.9	62.2	60.5	51.4	30.1	19.9	14.2	10.6	8.3	6.7	5.5	4.6	3.9	3.4	2.9	2.6
373, 374, 375, 378, 379	70.2	68.1	66.2	64.4	62.7	53.3	30.9	20.3	14.4	10.7	8.3	6.7	5.5	4.6	3.9	3.3	2.9	2.5
360, 361, 362, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 422, 423, 431, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 520, 521, 522, 549, 641, 660, 661, 662, 663, 664, 801, 802, 804, 805, 806, 807, 808, 809, 812, 813, 815, 816, 817, 818, 819, 820, 822, 824, 825, 827, 828, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 845, 901, 931, 981, 5091, 5092, 5093	63.5	61.6	59.9	58.2	56.7	48.2	30.1	20.9	15.6	12.1	9.7	8.0	6.8	5.8	5.0	4.4	3.9	3.5
600, 601, 602, 603, 604, 605, 606	58.0	56.3	54.7	53.2	51.8	44.0	28.6	20.5	15.6	12.3	10.1	8.5	7.2	6.3	5.5	4.9	4.4	3.9
220, 221, 222, 611, 690, 691, 692, 693, 694	107.7	104.5	101.6	98.8	96.2	81.7	47.7	31.4	22.4	16.8	13.1	10.5	8.6	7.2	6.1	5.3	4.6	4.0
741, 743, 746	67.4	65.4	63.6	61.8	60.2	51.2	33.6	24.3	18.6	14.8	12.2	10.3	8.8	7.7	6.8	6.0	5.4	4.9
540, 541, 542, 543, 545, 546, 547, 548, 621, 650, 651, 652, 654, 655, 657, 658, 720, 721, 722, 762, 993, 7211	79.2	76.9	74.7	72.6	70.7	60.1	43.4	33.7	27.5	23.1	19.8	17.4	15.4	13.8	12.5	11.5	10.5	9.8
950, 951, 952, 953	79.9	77.6	75.4	73.3	71.3	60.6	33.9	21.6	14.9	10.9	8.4	6.6	5.3	4.4	3.7	3.1	2.7	2.3

Table 5g. Minimum number of trees per acre for forest land based on largest tally tree

Species	DBH of largest tally tree																	
	Seed-ling	**1.0-1.9**	**2.0-2.9**	**3.0-3.9**	**4.0-4.9**	**5.0-6.9**	**7.0-8.9**	**9.0-10.9**	**11.0-12.9**	**13.0-14.9**	**15.0-16.9**	**17.0-18.9**	**19.0-20.9**	**21.0-22.9**	**23.0-24.9**	**25.0-26.9**	**27.0-28.9**	**29.0+**
313, 345, 460, 461, 462, 463, 544, 729, 730, 731, 732, 740, 742, 744, 745, 747, 748, 749, 752, 753, 970, 971, 972, 973, 974, 975, 976, 977	68.4	66.4	64.5	62.7	61.0	51.9	30.4	20.1	14.3	10.7	8.4	6.7	5.5	4.6	3.9	3.4	3.0	2.6

Appendix 6. Glossary

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

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

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

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

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

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

ACTUAL LENGTH – For trees with broken or missing tops. The actual length of the tree is recorded to the nearest 1.0 foot from ground level to the highest remaining portion of the tree still present and attached to the bole. If the top is intact, this item may be omitted. Forked trees should be treated the same as unforked trees.

Agricultural Land – Land managed for crops, pasture, or other agricultural use. Evidence includes geometric field and road patterns, fencing, and the traces produced by livestock or mechanized equipment. The area must be at least 1.0 acre in size and 120.0 feet wide at the point of occurrence.

Annular plot – a circular ring with a beginning radius of 24.0 feet from subplot center and an ending radius of 58.9 feet.

ARTIFICIAL REGENERATION SPECIES – Indicates the predominant species that is planted or seeded in an artificially regenerated condition.

Blind check – a re-installation of a production plot done by a qualified crew without production crew data on hand. A full re-installation of the plot is recommended for the purpose of obtaining a measure of uncertainty in the data. If a full plot re-installation is not possible, then full subplots will be completed with a minimum of 15 total trees being remeasured. All plot-level information (e.g., boundary and condition information) will be collected on each blind check plot. The two data sets are maintained separately. Discrepancies between the two sets of data are not reconciled. Blind checks are done on production plots only.

Bole – The main stem of a tree, extending from one foot above the ground to the point on the tree where DOB reaches 4 inches.

Botched plot – A plot that should not be included in the standard inventory data base due to data collection errors or other problems.

Boundary – The intersection of two or more conditions on a subplot or microplot. Each boundary is described by recording the azimuth and horizontal distance from the subplot or microplot center to the left and right points of where the boundary intersects the perimeter of the subplot or microplot. An azimuth and distance to a corner point may also be described, if one exists. If multiple boundaries exist at a subplot, they are recorded in the order of their occurrence on the subplot, starting from north and proceeding around the compass.

Census Water – Rivers and streams that are more than 200 feet wide and bodies of water that are greater than 4.5 acres in size.

Certification plot – a plot installed by a certification candidate. It may be a training plot or a production plot. The candidate working alone installs the plot.

Cold check – An inspection of a production plot done either as part of the training process, periodic review of field crew performance, or as part of the ongoing QA/QC program. Normally the installation crew is not present at the time of inspection. The inspector has the completed data in-hand at the time of inspection. The inspection can include the whole plot or a subset of the plot. Discrepancies between the inspection crew measurements and the production crew measurements are identified, and changes may be made to production data to correct these errors. Cold checks are done on production plots only.

CONDITION CLASS – The combination of discrete landscape and forest attributes that identify and define different strata on the plot. Examples of such attributes include condition class status, forest type, stand origin, stand size, owner group, reserve status and stand density.

Cropland – Land under cultivation within the past 24 months, including orchards and land in soil improving crops, but excluding land cultivated in developing improved pasture.

CROWN CLASS – A classification of trees based on dominance in relation to adjacent trees within the stand as indicated by crown development and the amount of sunlight received from above and sides.

Cultivar - The international term cultivar denotes an assemblage of cultivated plants that is clearly distinguished by any characters (morphological, physiological, cytological, chemical, or others) and when reproduced (sexually or asexually), retains its distinguishing characters. The term is derived from "cultivated variety," or their etymological equivalents in other languages. For cultivated plants, the term cultivar is the equivalent of a botanical variety, in accordance with the International Code of Nomenclature of Cultivated Plants 1980. Usage: cultivar names are not italicized and are indicated by single quotes at first use, or the word cultivar (but not both). The abbreviation cv. is properly used only with a binomial name: Genus species cv. cultivar name. Omit the abbreviation if single quotes are used: Genus species 'cultivar name'. (National Resources Conservation Service [NRCS] 2010. Title 190 – National Plant Materials Manual: Part 542.1 Glossary of Terms for Use in Plant Materials. 190-V-NPMM, Fourth Edition, July 2010. p. 13. Available online:
https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/about/handbook/.)

Cull – Portions of a tree that are unusable for industrial wood products because of rot, form, or other defect.

Diameter at Breast Height (DBH) – The diameter of the bole of a tree at breast height (4.5 feet above the ground), measured outside of the bark.

Diameter at Root Collar (DRC) – The diameter of a tree measured at the ground line or stem root collar, measured outside of the bark.

Diameter Outside Bark (DOB) – A diameter that may be taken at various points on a tree, or log, **outside** of the bark. Diameter Outside Bark is often estimated.

Federal Information Processing Standard (FIPS) – A unique code identifying U.S. States and counties (or units in Alaska).

Forest Industry Land – Land owned by companies or individuals that operate wood-using plants.

FOREST TYPE – A classification of forest land based upon the trees or tree communities that constitute the majority of stocking on the site.

GPS – Global Positioning System. Information from this system is collected and used to determine the latitude and longitude of each plot.

Hardwoods – Dicotyledonous trees, usually broad-leaved and deciduous.

Hot check – an inspection normally done as part of the training process. The inspector is present on the plot with the trainee and provides immediate feedback regarding data quality. Data errors are corrected. Hot checks can be done on training plots or production plots.

Hybrid - (1) Offspring of a cross between genetically dissimilar individuals. (2) First-generation progeny resulting from the controlled cross-fertilization between individuals that differ in one or more genes. (National Resources Conservation Service [NRCS] 2010. Title 190 – National Plant Materials Manual: Part 542.1 Glossary of Terms for Use in Plant Materials. 190-V-NPMM, Fourth Edition, July 2010. p. 27. Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/about/handbook/.)

Idle Farmland -- Former cropland or pasture that has not been tended within the last 2 years and that has less than 10 percent stocking with live trees.

Improved Pasture -- Land that is currently maintained and used for grazing. Evidence of maintenance, besides the degree of grazing, includes condition of fencing, presence of stock ponds, periodic brush removal, seeding, irrigation, or mowing.

Inclusion – An area that would generally would be recognized as a separate condition, except that it is not large enough to qualify. For example, a ½ acre pond within a forested stand.

Industrial Wood – All roundwood products, except firewood.

Inspection crew – a crew of qualified QC/QA individuals whose primary responsibility is the training, certification and inspection of production crews.

Land Area – As defined by the Bureau of the Census: The area of dry land and land temporarily or partially covered by water such as marshes, swamps, and river flood plains (omitting tidal flats below mean tide); streams, sloughs, estuaries and canals less than 200 feet in width, and ponds less than 4.5 acres in area.

Macroplot – A circular, fixed area plot with a radius of 58.9 feet. Macroplots may be used for sampling relatively rare events.

Mainland Exclusion (MLE) - Tally species limited to Caribbean and Pacific islands, including Hawaii. Such species are not valid tally trees on the mainland (continental) United States.

Maintained Road – Any road, hard topped or other surfaces, that is plowed or graded periodically and capable of use by a large vehicle. Rights-of-way that are cut or treated to limit herbaceous growth are included in this area.

Marsh – Low, wet areas characterized by heavy growth of weeds and grasses and an absence of trees.

Master Species List - All species listed in Appendix 3. After taking into account the three geographical exclusion areas, these are the species used to define FIA Forest Land. Species not listed are considered shrubs and do not factor into defining FIA Forest.

Measure Low Approach – A method of measuring DBH on trees where the following originate at the approximate same location on the bole preventing accurate and repeatable diameter measurement: multiple forks, prolific branching, or a combination of multiple forks and prolific branching. This method is also applied in situations where forked trees are grown together in such a fashion that an accurate and repeatable diameter cannot be measured OR estimated due to the deformation resulting from the presence of the above mentioned criteria. In such cases a single tree is tallied and the diameter is measured at the highest most repeatable location between the 1-foot stump and the initial pith separation.

Measurement Quality Objective (MQO) – Describes the acceptable tolerance for each data element. MQOs consist of two parts: a statement of the tolerance and a percentage of time when the collected data are required to be within tolerance.

Merchantable Top – The point on the bole of trees above which merchantable material cannot be produced. Merchantable top is 1.5 inches for woodland species and 4.0 inches for all other species.

Microplot – A circular, fixed-radius plot with a radius of 6.8 feet that is used to sample trees less than 5.0 inches at DBH, as well as other vegetation.

National Forest Land – Federal lands which have been legally designated as National Forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

National Forest Region Exclusion (NFS 1, 2, 3, 4, 5, 6, 8, 9, and/or 10) – These species are not valid tally trees on plots within the specified National Forest System Region. However, they are valid on plots that are located within urban areas in that NFS Region.

Native American (Indian) Land – Tribal lands held in fee, or trust, by the Federal government but administered for Indian tribal groups and Indian trust allotments. This land is considered “Private Lands”, Owner Group 40.

Noncensus Water – Bodies of water from 1 to 4.5 acres in size and water courses from 30 feet to 200 feet in width.

Nonforest Land -- Land that does not support, or has never supported, forests, and lands formerly forested where use for timber management is precluded by development for other uses. Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining rights-of-way, power line clearings of any width, and noncensus water. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120.0 feet wide, and clearings, etc., more than one acre in size, to qualify as nonforest land.

Nonstockable – Areas of forest land that are not capable of supporting trees because of the presence of rock, water, etc.

Non-Urban Exclusion (NUE) – Tally species excluded from non-urban areas. These species are only valid tally trees on plots that are located within urban areas.

Other Federal Lands – Federal land other than National Forests. These include lands administered by the USDI Bureau of Land Management, USDI National Park Service, USDI Fish and Wildlife Service, Department of Defense, Department of Energy, Army Corps of Engineers, and military bases.

OWNER CLASS -- A variable that classifies land into fine categories of ownership.

OWNER GROUP – A variable that classifies land into broad categories of ownership; Forest Service, Other Federal Agency, State and Local Government, and Private. Differing categories of Owner Group on a plot require different conditions.

Phase 1 (P1) – FIA activities done as part of remote-sensing and/or aerial photography.

Phase 2 (P2) – FIA activities done on the network of ground plots formerly known as FIA plots.

Phase 3 (P3) – FIA activities done on a subset of Phase 2 plots formerly known as Forest Health Monitoring plots. Additional ecological indicator information is collected from Phase 3 plots.

Plot – A cluster of four subplots that samples approximately 1/6 acre. The subplots are established so that subplot 1 is centered within the sample and the centers of subplots 2, 3, and 4 are located 120.0 feet from the center of subplot 1 at azimuths of 360, 120, and 240 degrees, respectively. Each subplot has an associated microplot and macroplot.

PRIVATE OWNER INDUSTRIAL STATUS – Indicates whether Private land owners own and operate a wood processing plant.

Production crew – a crew containing at least one certified individual. The crew is involved in routine installation of plots.

Production plot – A plot measured by a production crew. These plots may also be used for training purposes.

Reference plot (off grid) – A plot that is used for crew certification. These plots are NOT included in the ongoing inventory process and data from these plots do not become part of the standard inventory data base. To ensure that these plots do not enter into the inventory data base, they are assigned plot numbers outside the normal range of production plots or other invalid plot identification information such as an invalid STATE code (STATECD).

REGENERATION STATUS – A stand descriptor that indicates whether a stand has been naturally or artificially regenerated.

Reserved Land – Land that is withdrawn from timber utilization by a public agency or by law.

RESERVE STATUS – An indication of whether the land in a condition has been reserved.

Saplings – Live trees 1.0 to 4.9 inches DBH.

Seedlings – Conifer seedlings must be at least 6.0 inches in length and less than 1.0 inch at DBH/DRC in order to qualify for tallying. Hardwood seedlings must be at least 12.0 inches in length and less than 1.0 inch at DBH/DRC in order to qualify for tallying. For woodland species, each stem on a single tree must be less than 1.0 inch in DRC.

Softwoods – Coniferous trees, usually evergreen having needles or scale-like leaves.

STAND AGE – A stand descriptor that indicates the average age of the live trees not overtopped in the predominant stand size-class of a condition.

STAND DENSITY – A stand descriptor that indicates the relative tree density of a condition class. The classification is based on the number of stems/unit area, basal area, tree cover, or stocking of all live trees in the condition which are not overtopped, compared to any previously defined condition class tree density.

STAND SIZE – A stand descriptor that indicates which size-class of trees that are not overtopped constitutes the majority of stocking in the stand.

State, County and Municipal Lands – Lands owned by states, counties, and local public agencies or municipalities, or lands leased to these government units for 50 years or more.

Stocking – The relative degree of occupancy land by trees, measured as basal area or the number of trees in a stand by size or age and spacing, compared to the basal area or number of trees required to fully utilize the growth potential of the land; that is, the stocking standard.

Subplot – A circular, fixed-area plot with a radius of 24.0 feet. Each subplot represents ¼ of the fixed plot sample unit.

Subspecies - A grouping within a species used to describe geographically isolated variants, a category above "variety," and is indicated by the abbreviation "ssp." in the scientific name (Natural Resource Conservation Service (NRCS) PLANTS Database September 15, 2017 version maintained by the Forest Inventory and Analysis Information management group as database table REF_PLANT_DICTIONARY [USDA, NRCS. September 15, 2017. The Plants Database. http://plants.usda.gov/plants. National Plant Data Center, Baton Rouge, LA 70874-4490])

TOTAL LENGTH – The total length of the tree, recorded to the nearest 1.0 foot from ground level to the tip of the apical meristem. For trees growing on a slope, measure on the uphill side of the tree. If the tree has a broken or missing top, the total length is estimated to what the length would be if there were no missing or broken top. Forked trees should be treated the same as unforked trees

Training (practice) plot – A plot established for training or certification purposes only. It is NOT a plot in the ongoing inventory process and data from these plots do not become part of the standard inventory data base. To ensure that these plots do not enter into the inventory data base, they are assigned plot numbers outside the normal range of production plots or other invalid plot identification information such as an invalid STATE code (STATECD).

Transition Zone – An area where a distinct boundary between two or more different conditions cannot be determined.

Tree (FIA definition) - All species on the Master Species List. In FIA, a tree is defined as any plant on the tree list in the current field manual. When deciding whether to add or remove species from the tree list, species form is taken into account and a tree is generally described as a woody perennial plant, typically large, with a single well-defined stem carrying a more or less definite crown, sometimes defined as attaining a minimum diameter of 3.0 inches (7.6 cm) and a minimum height of 15 feet (4.6 m) at maturity.

Urban areas - These are census defined areas with a population density of 500 people per square mile associated with a town or city with a population of at least 2,500.

Variety - (1a) The botanical nomenclature division consisting of more or less recognizable entities within a species that are not genetically isolated from each other, below the level of subspecies, and is indicated by the abbreviation "var." in the scientific name (see "botanical variety"); (1b) The rank of taxa below subspecies but above forma; a plant which retains most of the characteristics of the species, but differs in some way such as flower or leaf color, size of mature plant, etc. A variety is added to the specific binomial and preceded by "var.," such as *saxatilis* in the epithet *Juniperus communis* var. *saxatilis*. (2) Term used in some national and international legislation to denominate one clearly distinguishable taxon from another; equivalent to "cultivar." (Note: the PMP does not recognize the terms "variety" and "cultivar" as

equivalent.). (National Resources Conservation Service [NRCS] 2010. Title 190 – National Plant Materials Manual: Part 542.1 Glossary of Terms for Use in Plant Materials. 190-V-NPMM, Fourth Edition, July 2010. p. 54. Available online: https://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/about/handbook/.)

Appendix 7. Tolerance / MQO / Value / Units / Field Width/ When Collected Table

Core optional variables are in italics. N/A is not applicable. Variables with both a core and core optional listing are marked with an asterisk.

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
General Description						
New Subplot Location	+/- 7 feet	At least 95% of the time	N/A	feet	N/A	N/A
New Microplot Location	+/- 1 foot	At least 95% of the time	N/A	feet	N/A	N/A
Plot Level Data						
STATE	No errors	At least 99% of the time	Appendix 1	N/A	2 digits	All plots
COUNTY	No errors	At least 99% of the time	Appendix 1	N/A	3 digits	All plots
PLOT NUMBER	No errors	At least 99% of the time	00001 to 99999	N/A	5 digits	All plots
PLOT STATUS	No errors	At least 99% of the time	1 to 3	N/A	1 digit	All plots
NONFOREST SAMPLING STATUS	No errors	At least 99% of the time	0 to 1	N/A	1 digit	All plots
NONFOREST PLOT STATUS	No errors	At least 99% of the time	1 to 3	N/A	1 digit	When PLOT STATUS = 2 and NONFOREST SAMPLING STATUS = 1
PLOT NONSAMPLED REASON	No errors	At least 99% of the time	01 to 03 and 05 to 11	N/A	2 digits	When PLOT STATUS = 3
NONFOREST PLOT NONSAMPLED REASON	No errors	At least 99% of the time	02, 03, 08, 09, 10	N/A	2 digits	When PLOT STATUS = 2 and NONFOREST SAMPLING STATUS = 1 and NONFOREST PLOT STATUS = 3
SUBPLOTS EXAMINED	No errors	At least 90% of the time	1, 4	N/A	1 digit	All plots
SAMPLE KIND	No errors	At least 99% of the time	1 to 3	N/A	1 digit	All plots
PREVIOUS PLOT NUMBER	No errors	At least 99% of the time	00001 to 99999	N/A	5 digits	When SAMPLE KIND = 3
FIELD GUIDE VERSION	No errors	At least 99% of the time	9.0	N/A	2 digits	All plots
YEAR	No errors	At least 99% of the time	≥ 2003	year	4 digits	All plots
MONTH	No errors	At least 99% of the time	Jan – Dec (01 – 12)	month	2 digits	All plots
DAY	No errors	At least 99% of the time	01 to 31	day	2 digits	All plots
DECLINATION	*No errors*	*At least 99% of the time*	*+/- 50*	*degrees*	*5 digits including sign (+xxx.y)*	*CORE OPTIONAL: All plots*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
HORIZONTAL DISTANCE TO IMPROVED ROAD	No errors	At least 90% of the time	1 to 9	N/A	1 digit	When PLOT STATUS = 1 or PLOT STATUS = 2 and NONFOREST SAMPLING STATUS = 1 and NONFOREST PLOT STATUS =1
WATER ON PLOT	No errors	At least 90% of the time	0 to 5, 9	N/A	1 digit	When PLOT STATUS = 1 or PLOT STATUS = 2 and NONFOREST SAMPLING STATUS = 1 and NONFOREST PLOT STATUS = 1
QA STATUS	No errors	At least 99% of the time	1 to 7	N/A	1 digit	All plots
CREW NUMBER	No errors	At least 99% of the time	NRS 240001-249999 SRS 330001-339999 RMRS 220001-229999 PNW 260001-269999	N/A	6 digits	All plots
GPS UNIT	No errors	At least 99% of the time	0, 2, 3, 4	N/A	1 digit	All field visited plots
GPS SERIAL NUMBER	No errors	At least 99% of the time	000001 to 999999	N/A	6 digits	When GPS UNIT > 0
GPS ENTRY METHOD	No errors	At least 99% of the time	0, 1	N/A	1 digit	GPS UNIT > 0
GPS DATUM	No errors	At least 99% of the time	NAD83	N/A	5 characters (cccnn)	GPS UNIT > 0
COORDINATE SYSTEM	No errors	At least 99% of the time	1, 2	N/A	1 digit	GPS UNIT > 0
LATITUDE DEGREES	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	00-90	degrees	3 digits (1st digit is + or -, last 2 digits are numeric)	When COORDINATE SYSTEM = 1
LATITUDE MINUTES	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	00 – 59	minutes	2 digits	When COORDINATE SYSTEM = 1
LATITUDE SECONDS	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	0.00 – 59.99	seconds	4 digits	When COORDINATE SYSTEM = 1

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
LONGITUDE DEGREES	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	001 – 180	degrees	4 digits (1st digit is + or -, last 3 digits are numeric)	When COORDINATE SYSTEM = 1
LONGITUDE MINUTES	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	00 – 59	minutes	2 digits	When COORDINATE SYSTEM = 1
LONGITUDE SECONDS	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	0.00 – 59.99	seconds	4 digits	When COORDINATE SYSTEM = 1
UTM ZONE	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	Number varies from 2 in Alaska to 19 on the East Coast. The letter varies from Q in Hawaii to W in Alaska	N/A	3 digits: (##C)	When COORDINATE SYSTEM = 2
EASTING (X) UTM	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	0000000-9999999		7 digits	When COORDINATE SYSTEM = 2
NORTHING (Y) UTM	When GPS ENTRY METHOD = 0, no errors in data entry When GPS ENTRY METHOD = 1, not applicable	When GPS ENTRY METHOD = 0, at least 99% of the time When GPS ENTRY METHOD = 1, not applicable	0000000-9999999		7 digits	When COORDINATE SYSTEM = 2
AZIMUTH TO PLOT CENTER	+/- 3 degrees	At least 99% of the time	000 at plot center 001 to 360 not at plot center	degrees	3 digits	When GPS UNIT = 2, 3 or 4

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
DISTANCE TO PLOT CENTER	+/- 6 ft.	At least 99% of the time	000 at plot center 001 to 200 if a Laser range finder not used 001 to 999 if a Laser range finder is used	feet	3 digits	When GPS UNIT = 2, 3 or 4
GPS ELEVATION	No errors	At least 99% of the time	-00100 to 20000	feet	6 digits (1st digit is + or -, last 5 digits are numeric)	When GPS UNIT = 2 or 4
GPS ERROR	No errors	At least 99% of the time	000 to 999	feet	3 digits	When GPS UNIT = 2
NUMBER OF READINGS	No errors	At least 99% of the time	001 to 999	N/A	3 digits	When GPS UNIT = 2
GPS FILENAME	*No errors*	*At least 99% of the time*	*English words, phrases and numbers*	*N/A*	15 characters	When GPS UNIT = 3
MACROPLOT BREAKPOINT DIAMETER	*No errors*	*At least 99% of the time*	*21, 24, and 30*	*inches*	2 digits (xx)	All plots
PLOT NOTES	N/A	N/A	English, alpha-numeric	N/A	Unlimited alphanumeric character field	All plots
P2 VEGETATION SAMPLING STATUS	No errors	At least 99% of the time	0, 1, 2	N/A	1 digit	All plots
LEVEL OF DETAIL	No errors	At least 99% of the time	1, 2, 3	N/A	1 digit	When P2 VEGETATION SAMPLING STATUS = 1 or 2
INVASIVE PLANT SAMPLING STATUS	No errors	At least 99% of the time	0, 1, 2	N/A	1 digit	All plots
INVASIVE PLANT SPECIMEN COLLECTION RULE	No errors	At least 99% of the time	0, 1	N/A	1 digit	Downloaded on all plots where INVASIVE PLANT SAMPLING STATUS = 1 or 2
DWM SAMPLING STATUS (BASE)	No errors	At least 99% of the time	0, 1, 2, 3	N/A	1 digit	All plots
DWM NUMBER OF SUBPLOTS (BASE)	No errors	At least 99% of the time	1 to 4	N/A	1 digit	All plots where DWM SAMPLING STATUS >0
DWM NUMBER OF TRANSECTS ON SUBPLOT (BASE)	No errors	At least 99% of the time	1, 2, 3	N/A	1 digit	All plots where DWM SAMPLING STATUS >0
DWM TRANSECT LENGTH (BASE)	+/- 1 ft.	At least 95% of the time	24.0 to 58.9	feet	3 digits (xx.y)	All plots where DWM SAMPLING STATUS >0
DWM SUBPLOT LIST	No errors	At least 99% of the time	1000 to 4000	N/A	4 digits	All plots where DWM SAMPLING STATUS >0

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
DWM NOTES (BASE)	N/A	N/A	English language words, phrases, and numbers	N/A	Unlimited alphanumeric character field	All plots where DWM SAMPLING STATUS >0, as needed
Condition Class Information						
CONDITION CLASS NUMBER	No errors	At least 99% of the time	1 to 9	N/A	1 digit	All condition classes
CONDITION CLASS STATUS	No errors	At least 99% of the time	1, 2, 3, 4, 5	N/A	1 digit	All condition classes
FOREST LAND CONDITION STATUS CHANGE	No errors	At least 90% of the time	0, 1, 2, 3	N/A	1 digit	CONDITION CLASS STATUS = 1, 2, 3, or 4 on remeasured plots
CONDITION NONSAMPLED REASON	No errors	At least 99% of the time	01, 02, 03, 05, 06, 07, 08, 09, 10, 11	N/A	2 digits	When CONDITION CLASS STATUS = 5
NONFOREST CONDITION CLASS STATUS	No errors	At least 99% of the time	2, 5	N/A	1 digit	When CONDITION CLASS STATUS = 2 and NONFOREST SAMPLING STATUS = 1
NONFOREST CONDITION NONSAMPLED REASON	No errors	At least 99% of the time	02, 03, 10	N/A	2 digits	When CONDITION CLASS STATUS = 2 and NONFOREST SAMPLING STATUS = 1 and NONFOREST CONDITION CLASS STATUS = 5
RESERVED STATUS*	No errors	At least 99% of the time	0, 1	N/A	1 digit	CORE: CONDITION CLASS STATUS = 1 CORE OPTIONAL: All condition classes
OWNER GROUP*	No errors	At least 99% of the time	10, 20, 30, 40	N/A	2 digits	CORE: CONDITION CLASS STATUS = 1 CORE OPTIONAL: All condition classes Field width: 2 digits
FOREST TYPE	No errors in group or type	At least 99% of the time in group At least 95% of the time in type no MQO when STAND SIZE CLASS = 0	Appendix 2	N/A	3 digits	When CONDITION CLASS STATUS = 1
STAND SIZE CLASS	No errors	At least 99% of the time	0, 1, 2, 3, 4, 5	class	1 digit	When CONDITION CLASS STATUS = 1
REGENERATION STATUS	No errors	At least 99% of the time	0, 1	N/A	1 digit	When CONDITION CLASS STATUS = 1
TREE DENSITY	No errors	At least 99% of the time	1, 2, 3	N/A	1 digit	When CONDITION CLASS STATUS = 1
OWNER CLASS*	No errors	At least 99% of the time	11-13; 21-25; 31-33; 41-45	class	2 digits	CORE: When CONDITION CLASS STATUS = 1 CORE OPTIONAL: All condition classes
OWNER SUB-CLASS	*No errors*	*At least 95% of the time*	*1-4*	*N/A*	*1 digit*	*When OWNER CLASS = 31*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
PUBLIC ADMINISTRATIVELY WITHDRAWN STATUS	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*When OWNER CLASS <40 and RESERVED STATUS=0*
ADMINISTRATIVELY WITHDRAWN AREA NAME	*No errors*	*At least 99% of the time*	*English language word, phrases, and numbers*	*N/A*	*Alphanumeric character field*	*All conditions with PUBLIC ADMINISTRATIVELY WITHDRAWN STATUS=1*
ADMINISTRATIVELY WITHDRAWN NOTES	*N/A*	*N/A*	*English language word, phrases, and numbers*	*N/A*	Unlimited alphanumeric character field	*When ADMINISTRATIVELY WITHDRAWN STATUS is 0 or 1*
RESERVED AREA NAME	No errors	At least 99% of the time	English language word, phrases, and numbers	N/A	Alphanumeric character field	All conditions with RESERVED STATUS=1
ARTIFICIAL REGENERATION SPECIES	No errors	At least 99% of the time	Appendix 3	N/A	4 digits	When CONDITION CLASS STATUS = 1 and REGENERATION STATUS = 1
STAND AGE	+/- 10%	At least 95% of the time	000 to 997, 998, 999	number of years	3 digits	When CONDITION CLASS STATUS = 1
DISTURBANCE 1	No errors	At least 99% of the time	00; 10-12; 20-22; 30-32;40-46; 50-54; 60; 70; 80; 90-95	N/A	2 digits	When CONDITION CLASS STATUS = 1 or NONFOREST SAMPLING STATUS = 1 and NONFOREST CONDITION CLASS STATUS = 2
DISTURBANCE YEAR 1	+/- 1 year for 5-year measurement cycles +/ 2 years for >5-year measurement cycles	At least 99% of the time	Since the previous plot visit, or the past 5 years for plots visited for the first time; 9999 if disturbance occurs continuously over time	year	4 digits	When DISTURBANCE 1 > 00
DISTURBANCE 2	No errors	At least 99% of the time	00; 10-12; 20-22; 30-32;40-46; 50-54; 60; 70; 80; 90-95	N/A	2 digits	When CONDITION CLASS STATUS = 1 or NONFOREST SAMPLING STATUS = 1 and NONFOREST CONDITION CLASS STATUS = 2
DISTURBANCE YEAR 2	+/- 1 year for 5-year measurement cycles +/ 2 years for >5-year measurement cycles	At least 99% of the time	Since the previous plot visit, or the past 5 years for plots visited for the first time; 9999 if disturbance occurs continuously over time	year	4 digits	When DISTURBANCE 2 > 00
DISTURBANCE 3	No errors	At least 99% of the time	00; 10-12; 20-22; 30-32;40-46; 50-54; 60; 70; 80; 90-95	N/A	2 digits	When CONDITION CLASS STATUS = 1 or NONFOREST SAMPLING STATUS = 1 and NONFOREST CONDITION CLASS STATUS = 2

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
DISTURBANCE YEAR 3	+/- 1 year for 5-year measurement cycles +/ 2 years for >5-year measurement cycles	At least 99% of the time	Since the previous plot visit, or the past 5 years for plots visited for the first time; 9999 if disturbance occurs continuously over time	year	4 digits	When DISTURBANCE 3 > 00
TREATMENT 1	No errors	At least 99% of the time	00, 10, 20, 30, 40, 50	N/A	2 digits	When CONDITION CLASS STATUS = 1
TREATMENT YEAR 1	+/- 1 year for 5-year measurement cycles +/- 2 years for >5-year measurement cycles	At least 99% of the time	Since the previous plot visit, or the past 5 years for plots visited for the first time	year	4 digits	When TREATMENT 1 > 00
TREATMENT 2	No errors	At least 99% of the time	00, 10, 20, 30, 40, 50	N/A	2 digits	When CONDITION CLASS STATUS = 1
TREATMENT YEAR 2	+/- 1 year for 5-year measurement cycles +/- 2 years for >5-year measurement cycles	At least 99% of the time	Since the previous plot visit, or the past 5 years for plots visited for the first time	year	4 digits	When TREATMENT 2 > 00
TREATMENT 3	No errors	At least 99% of the time	00, 10, 20, 30, 40, 50	N/A	2 digits	When CONDITION CLASS STATUS = 1
TREATMENT YEAR 3	+/- 1 year for 5-year measurement cycles +/- 2 years for >5-year measurement cycles	At least 99% of the time	Since the previous plot visit, or the past 5 years for plots visited for the first time	year	4 digits	When TREATMENT 3 > 00
PHYSIOGRAPHIC CLASS	No errors	At least 80% of the time	xeric: 11, 12, 13, 19 mesic: 21, 22, 23, 24, 25, 29 hydric: 31, 32, 33, 34, 35, 39	N/A	2 digits	When CONDITION CLASS STATUS = 1 or NONFOREST SAMPLING STATUS = 1 and NONFOREST CONDITION CLASS STATUS = 2
LCOVER CLASS	No errors	At least 95% of the time	01-05; 08-10	N/A	2 digits	All condition classes
PRESENT NONFOREST LAND USE	No errors	At least 99% of the time	10-17; 20; 30-34; 40, 41, 42, 43, 45	N/A	2 digits	CONDITION CLASS STATUS = 2
CANOPY COVER SAMPLE METHOD	None	At least 90% of the time	1-4	N/A	1 digit	CONDITION CLASS STATUS = 1, 2, or 5
LIVE CANOPY COVER	No errors for 0-12% live canopy cover; 10% for 13-20% live canopy cover; 25% for 21-100% live canopy cover	At least 99% of the time	00-99 (where 99 = 99-100)	percent	2 digits	CONDITION CLASS STATUS = 1, 2, or 5

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
LIVE PLUS MISSING CANOPY COVER	No errors% for 0-12% live plus missing canopy cover; 10% for 13-20% live plus missing canopy cover; 25% for 21-100% live plus missing canopy cover	At least 80% of the time	00-99 (where 99 = 99-100)	percent	2 digits	CONDITION CLASS STATUS = 1, 2, or 5
CURRENT AFFORESTATION CODE	No errors	At least 99% of the time	0, 1	N/A	1 digit	CONDITION CLASS STATUS = 1 or 2
PREVIOUS AFFORESTATION CODE	No errors	At least 99% of the time	0, 1	N/A	1 digit	When SAMPLE KIND = 2 and CONDITION CLASS STATUS = 1 or 2
TOTAL STEMS	10%	At least 90% of the time	00000-99999	N/A	5 digits	CURRENT AFFORESTATION CODE = 1 or PREVIOUS AFFORESTATION CODE = 1
CHAINING CODE	No errors	At least 99% of the time	0, 1	N/A	1 digit	When CONDITION CLASS STATUS = 1 or 2
CONDITION FUELBED TYPE (OPTIONAL)	*+/- 1 class within a type*	*At least 80% of the time*	*GR1, GR2, GR3, GR4, GR5, GR6, GR7, GR8, GR9, GS1, GS2, GS3, GS4, SB1, SB2, SB3, SB4, SH1, SH2, SH3, SH4, SH5, SH6, SH7, SH8, SH9, TL1, TL2, TL3, TL4, TL5, TL6, TL7, TL8, TL9, TU1, TU2, TU3, TU4, TU5, NB1, NB2, NB3, NB8, NB9*	*N/A*	*3 alpha-numeric characters*	*All conditions where DWM SAMPLING STATUS >0*
Subplot Information						
SUBPLOT NUMBER	No errors	At least 99% of the time	1, 2, 3, 4	N/A	1 digit	All subplots
SUBPLOT/ MACROPLOT STATUS	No errors	At least 99% of the time	1, 2, 3, 4	N/A	1 digit	All subplots
SUBPLOT NONSAMPLED REASON	No errors	At least 99% of the time	01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11	N/A	2 digits	When SUBPLOT/MACROPLOT STATUS = 3
NONFOREST SUBPLOT/MACROPLOT STATUS	No errors	At least 99% of the time	1, 2, 3	N/A	1 digit	When NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 2

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
NONFOREST SUBPLOT/MACROPLOT NONSAMPLED REASON	No errors	At least 99% of the time	02, 03, 04, 10	N/A	2 digits	When NONFOREST SAMPLING STATUS = 1 and SUBPLOT/MACROPLOT STATUS = 2 and NONFOREST SUBPLOT/MACROPLOT STATUS = 3
SUBPLOT CENTER CONDITION	No errors	At least 99% of the time	1 to 9	N/A	1 digit	All subplots
MICROPLOT CENTER CONDITION	No errors	At least 99% of the time	1 to 9	N/A	1 digit	All microplots
SUBPLOT SLOPE	+/- 10 %	At least 90% of the time	000 to 155	percent	3 digits	When SUBPLOT/MACROPLOT STATUS = 1 or NONFOREST SUBPLOT/MACROPLOT STATUS = 1
SUBPLOT ASPECT	+/- 10 degrees	At least 90% of the time	000 to 360	degrees	3 digits	When SUBPLOT/MACROPLOT STATUS = 1 or NONFOREST SUBPLOT/MACROPLOT STATUS = 1
SNOW/WATER DEPTH	+/- 0.5 ft.	At the time of measurement	0.0 to 9.9	feet	2 digits (x.y)	When SUBPLOT/MACROPLOT STATUS = 1 or NONFOREST SUBPLOT/MACROPLOT STATUS = 1)
SUBPLOT/ MACROPLOT CONDITION LIST	No errors	At least 99% of the time	1000 to 9876	N/A	4 digits	All plots
P2 VEG SUBPLOT SAMPLE STATUS	*No errors*	*At least 99% of the time*	*1, 2*	*N/A*	*1 digit*	*When P2 VEGETATION SAMPLING STATUS=1 and at least one accessible forest land condition (CONDITION CLASS STATUS = 1) exists within the 24-foot radius subplot, or P2 VEGETATION SAMPLING STATUS=2 and at least one accessible forest condition or measurable nonforest condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) exists within the 24-foot radius subplot.*
VEGETATION NONSAMPLED REASON	*No errors*	*At least 99% of the time*	*04, 05, 10*	*N/A*	*2 digits*	*On all subplots where P2 VEG SUBPLOT SAMPLE STATUS = 2*
VEGETATION SUBPLOT NOTES	*N/A*	*N/A*	*English language words, phrases, and numbers*	*N/A*	*2000 alphanumeric characters*	*VEGETATION NONSAMPLED REASON = 10 or as needed*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
INVASIVE PLANT SUBPLOT SAMPLE STATUS	*No errors*	*At least 99% of the time*	*1, 2, 3*	*N/A*	*1 digit*	*On all subplots where invasive species are being sampled on accessible forest land (INVASIVE PLANT SAMPLING STATUS=1 and at least one accessible forest land condition (CONDITION CLASS STATUS = 1) exists within the 24-foot radius subplot, or invasive species are being sampled on all accessible land conditions (INVASIVE PLANT SAMPLING STATUS=2) and at least one accessible forest condition or measurable nonforest condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) exists within the 24-foot radius subplot*
INVASIVE PLANT NONSAMPLED REASON	*No errors*	*At least 99% of the time*	*4, 5, 10*	*N/A*	*2 digits*	*On all subplots where INVASIVE PLANT SUBPLOT SAMPLE STATUS = 3*
INVASIVE PLANT DATA NOTES	*N/A*	*N/A*	*English language words, phrases, and numbers*	*N/A*	*Unlimited alphanumeric character field*	*INVASIVE PLANT NONSAMPLED REASON=10 or as needed*
UNLISTED TREE PRESENT	No errors	At least 90% of the time	0, 1	N/A	1 digit	All subplots with CONDITION CLASS STATUS = 1; CONDITION CLASS STATUS = 2, 3, 4 when completing nonforest inventories
UNLISTED TREE GENUS	No errors	At least 70% of the time	English language letters	N/A	70 characters	When UNLISTED TREE PRESENT = 1
UNLISTED TREE SPECIES	No errors	At least 70% of the time	English language letters	N/A	70 characters	When UNLISTED TREE PRESENT = 1
UNLISTED TREE SPECIES COUNT	+/- 10%	At least 70% of the time	1 to 99	N/A	2 digits	For each UNLISTED SPECIES encountered
UNLISTED TREE SPECIMEN COLLECTED	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*All UNLISTED TREE SPECIES records. Collected in NRS, RMRS*
SPECIMEN LABEL NUMBER	*No errors*	*At least 99% of the time*	*1 to 99999, as pre-assigned by FIA unit*	*N/A*	*5 digits*	*When UNLISTED TREE SPECIMEN COLLECTED = 1. Collected in NRS, RMRS.*
UNLISTED TREE NOTES	N/A	N/A	English language words, phrases, and numbers	N/A	Unlimited alphanumeric character field	Required for each UNLISTED TREE SPECIES record
Boundary Data						
SUBPLOT NUMBER	No errors	At least 99% of the time	1, 2, 3 4	N/A	1 digit	All boundaries
PLOT TYPE	No errors	At least 99% of the time	1, 2, 3, 4	N/A	1 digit	All boundaries

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
BOUNDARY CHANGE	No errors	At least 99% of the time	0, 1, 2, 3	N/A	1 digit	SAMPLE KIND = 2, All boundaries
CONTRASTING CONDITION	No errors	At least 99% of the time	1 to 9	N/A	1 digit	All boundaries
LEFT AZIMUTH	+/- 10 degrees	At least 90% of the time	001 to 360	degrees	3 digits	All boundaries
CORNER AZIMUTH	+/- 10 degrees	At least 90% of the time	000 to 360	degrees	3 digits	All boundaries
CORNER DISTANCE	+/- 1 ft.	At least 90% of the time	microplot: 001 to 007 (6.8 ft.. actual limiting distance) subplot:001 to 024 macroplot: 001 to 059 (58.9 ft.. actual limiting distance) hectare: 001 to 185	feet	3 digits	All boundaries when CORNER AZIMUTH > 000
RIGHT AZIMUTH	+/- 10 degrees	At least 90% of the time	001 to 360	degrees	3 digits	All boundaries
Tree and Sapling Data						
SUBPLOT NUMBER	No errors	At least 99% of the time	1, 2, 3, 4	N/A	1 digit	All tree records
TREE RECORD NUMBER	No errors	At least 99% of the time	000, 001 to 999	N/A	3 digits	All tree records
CONDITION CLASS NUMBER	No errors	At least 99% of the time	1 to 9	N/A	1 digit	All tree records
AZIMUTH	+/- 10 degrees	At least 90% of the time	001 to 360	degrees	3 digits	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC
HORIZONTAL DISTANCE	Microplot:+/- 0.2 ft.; Microplot woodland species: +/- 0.4 ft.; Subplot: +/- 1.0 ft. from 0.1 to 23.0 ft.; Subplot: +/-0.2 ft. from 23.1 to 24.0 ft.; Subplot multi-stemmed woodland species: +/- 2.0 ft.; Annular plot: +/- 3.0 ft. from 24.0 to 55.9 ft.; Annular plot: +/- 1.0 ft. from 55.9 to 58.9 ft.; Annular plot woodland species: +/- 6.0 ft.	At least 90% of the time	Microplot: 00.1 to 06.8 Subplot: 00.1 to 24.0 Annular plot: 24.1 to 58.9	feet	3 digits (xx.y)	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC
PREVIOUS TREE STATUS	No errors	At least 95% of the time	1, 2	N/A	1 digit	On SAMPLE KIND = 2, all previously tallied trees ≥ 1.0 inch DBH

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
PRESENT TREE STATUS	No errors	At least 95% of the time	0, 1, 2, 3	N/A	1 digit	All new live and standing dead tally trees ≥ 1.0 inch DBH/DRC On remeasurement plots, all previously tallied trees
RECONCILE	No errors	At least 95% of the time	1 to 2: valid for new trees on the plot (PRESENT TREE STATUS = 1 or 2) 5: valid only for remeasured trees (PRESENT TREE STATUS = 0) that no longer qualify as tally 6-9: valid for both new tally trees (PRESENT TREE STATUS = 1 or 2) and remeasured trees that no longer qualify as tally (PRESENT TREE STATUS = 0).	N/A	1 digit	On SAMPLE KIND = 2; all new live and standing dead tally trees and saplings ≥ 1.0 inch DBH/DRC (PRESENT TREE STATUS = 1 or 2 and no PREVIOUS TREE STATUS) and all no status trees (PRESENT TREE STATUS = 0)
STANDING DEAD	No errors	At least 99% of the time	0, 1	N/A	1 digit	SAMPLE KIND = 2 only: All dead tally trees (PRESENT TREE STATUS = 2)
MORTALITY	*No errors*	*At least 85% of the time*	*0, 1*	*N/A*	*1 digit*	*All standing dead trees 1.0 inch DBH/DRC and larger that were live within the past 5 years if no previous inventory (PRESENT TREE STATUS = 2 on SAMPLE KIND = 1 or 3 plots).*
SPECIES	No errors	At least 99% of the time for genus At least 95% of the time for species	Appendix 3	N/A	4 digits	All tree records

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
DIAMETER	+/- 0.1 inch per 20.0 inch increment of measured diameter on all live trees and standing dead trees with DECAY CLASS = 1, 2; +/-1.0 inch per 20.0 inch increment of measured diameter on standing dead trees with DECAY CLASS = 3, 4, 5; For woodland species: +/- 0.2 inch per stem	At least 95% of the time	001.0 to 999.9	inches	4 digits (xxx.y)	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC
DRC STEM DIAMETER	+/- 0.2 inch per stem	At least 95% of the time	001.0 to 999.9	inch	4 digits (xxx.y)	All stems on woodland tree species that are at least 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point
DRC STEM STATUS	No errors	At least 95% of the time	1, 2	N/A	1 digit	All stems on woodland tree species that are at least 1 foot in length and at least 1.0 inch in diameter 1 foot up from the stem diameter measurement point
PAST NUMBER OF STEMS	No errors	At least 90% of the time	01 to 99	N/A	2 digits	Value is preprinted for SAMPLE KIND = 2 locations
CURRENT NUMBER OF STEMS	No errors	At least 90% of the time	01 to 99	N/A	2 digits	For tallied woodland species with at least one stem 1.0 inch in diameter or larger; includes woodland species tallied on the microplot
DIAMETER CHECK	No errors	At least 99% of the time	0, 1, 2	N/A	1 digit	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC
ROTTEN / MISSING CULL*	+/- 10%	At least 90% of the time	00 to 99	percent	2 digits	CORE: All live tally trees ≥ 5.0 in DBH/DRC CORE OPTIONAL: All live and standing dead tally trees ≥ 5.0 in DBH/DRC
TOTAL LENGTH	+/- 10% of true length	At least 90% of the time	001 to 400	feet	3 digits	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC
ACTUAL LENGTH	+/- 10% of true length	At least 90% of the time	001 to 400	feet	3 digits	All live and standing dead tally trees (with broken or missing tops) ≥1.0 inch DBH/DRC
LENGTH METHOD	No errors	At least 99% of the time	1,2, 3	N/A	1 digit	All live and standing dead tally trees ≥ 1.0 inch DBH/DRC
CROWN CLASS	No errors	At least 85% of the time	1, 2, 3, 4, 5	N/A	1 digit	All live tally trees ≥ 1.0 inch DBH/DRC

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
UNCOMPACTED LIVE CROWN RATIO*	+/- 10%	At least 90% of the time	00 to 99	percent	2 digits	Phase 2 CORE OPTIONAL: All live tally trees ≥ 5.0 inches DBH/DRC Phase 3 CORE: All live tally trees ≥ 1.0 inch DBH/DRC
COMPACTED CROWN RATIO	+/- 10%	At least 80% of the time	00 to 99	percent	2 digits	All live tally trees ≥ 1.0 inch DBH/DRC
DAMAGE AGENT 1*	No errors	Will be established following blind audit results	See Appendix 11	N/A	5 digits	CORE: All live tally trees ≥ 5.0 inches DBH/DRC CORE OPTIONAL: All live tally trees ≥ 1.0 inch DBH/DRC
DAMAGE AGENT 2*	1 of 2 damages correct	Will be established following blind audit results	See Appendix 11	N/A	5 digits	CORE: All live tally trees ≥ 5.0 inches DBH/DRC CORE OPTIONAL: All live tally trees ≥ 1.0 inch DBH/DRC
DAMAGE AGENT 3*	2 of 3 damages correct	Will be established following blind audit results	See Appendix 11	N/A	5 digits	CORE: All live tally trees ≥ 5.0 inches DBH/DRC CORE OPTIONAL: All live tally trees ≥ 1.0 inch DBH/DRC
CAUSE OF DEATH*	No errors	At least 80% of the time	10, 20, 30, 40, 50, 60, 70, 80	N/A	2 digits	CORE: SAMPLE KIND = 2 plots: all PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2 or 3; or PRESENT TREE STATUS = 2 and RECONCILE = 1, 2, or 3 CORE OPTIONAL: SAMPLE KIND = 1 plots; all MORTALITY = 1
MORTALITY YEAR	*+/- 1year for 5-year measure. cycles* *+/- 2years for > 5-year measure. cycles*	*At least 70% of the time*	*1994 or higher*	*year*	*4 digits*	*Plots where SAMPLE KIND = 2: all PREVIOUS TREE STATUS = 1 and PRESENT TREE STATUS = 2 or 3; or PRESENT TREE STATUS = 2 and RECONCILE = 1, 2, or 3.*
DECAY CLASS	+/- 1 class	At least 90% of the time	1, 2, 3, 4, 5	class	1 digit	All standing dead tally trees ≥ 1.0 inch DBH/DRC
LENGTH TO DIAMETER MEASUREMENT POINT	+/- 0.2 ft.	At least 90% of the time	00.1 – 15.0	feet	3 digits	All live and standing dead tally trees (except woodland species) ≥ 1.0 inch DBH
ROUGH CULL	*+/- 10%*	*At least 90% of the time*	*00 to 99*	*percent*	*2 digits*	*CORE OPTIONAL: All live tally trees ≥ 5.0 inches DBH/DRC*
DWARF MISTLETOE CLASS	*+/- 1 class*	*At least 90% of the time*	*0 to 6*	*class*	*1 digit*	*CORE OPTIONAL: All live conifer (except juniper) tally trees ≥ 1.0 inch DBH/DRC*
TREE NOTES	N/A	N/A	English, alpha-numeric	N/A	Alphanumeric character field	All trees

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
Seedling Data						
SUBPLOT NUMBER	No errors	At least 99% of the time	1, 2, 3, 4	N/A	1 digit	All counts of seedlings
SPECIES	No errors	At least 90% of the time for genus At least 85% of the time for species	Appendix 3	N/A	4 digits	All counts of seedlings
CONDITION CLASS NUMBER	No errors	At least 99% of the time	1-9	N/A	1 digit	All counts of seedlings
SEEDLING COUNT	No errors for 5 or less per species +/- 20% over a count of 5	At least 90% of the time	001-999	number	3 digits	Each accessible forest land condition class on each microplot
Site Tree Information						
CONDITION CLASS LIST	No errors	At least 99% of the time	1000 to 9876	N/A	4 digits	All site trees
SPECIES	No errors	At least 99% of the time for genus At least 95% of the time for species	See code list in text	N/A	4 digits	All site trees
DIAMETER	+/- 0.1 inch per 20.0 inch increment of measured diameter on all live trees and dead trees with DECAY CLASS = 1, 2; +/- 1.0 inch per 20.0 inch increment of measured diameter on dead trees with DECAY CLASS = 3, 4, 5; For woodland species: +/- 0.2 inch per stem	At least 95% of the time	001.0 to 999.9	inches	4 digits (xxx.y)	All site trees
SITE TREE LENGTH	+/- 10% of true length	At least 90% of the time	005 to 999	feet	3 digits	All site trees
TREE AGE AT DIAMETER	+/- 5 years	At least 95% of the time	001 to 999	year	3 digits	All site trees
SITE TREE NOTES	N/A	N/A	English, language words, phrases and numbers	N/A	alphanumeric character field	All site trees as necessary
SUBPLOT NUMBER	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All site trees*
AZIMUTH	*+/- 10 degrees*	*At least 90% of the time*	*001 to 360*	*degrees*	*3 digits*	*All site trees*
HORIZONTAL DISTANCE	*+/-5 ft.*	*At least 90% of the time*	*000.1 to 200.0*	*feet*	*4 digits (xxx.y)*	*All site trees*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
Phase 2 (P2) Vegetation Profile						
SUBPLOT NUMBER	*No errors*	*At least 99% of the time*	*1,2 ,3, 4*	*N/A*	*1 digit*	*On all subplots where P2 Vegetation is being sampled (P2 VEGETATION SAMPLING STATUS = 1 or 2)*
CONDITION CLASS NUMBER	*No errors*	*At least 99% of the time*	*1 to 9*	*N/A*	*1 digit*	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS =1)*
TALLY TREE SPECIES COVER LAYER 1	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
TALLY TREE SPECIES COVER LAYER 2	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
TALLY TREE SPECIES COVER LAYER 3	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
TALLY TREE SPECIES COVER LAYER 4	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
TALLY TREE SPECIES COVER – AERIAL VIEW	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
NON-TALLY TREE SPECIES COVER LAYER 1	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
NON-TALLY TREE SPECIES COVER LAYER 2	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
NON-TALLY TREE SPECIES COVER LAYER 3	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
NON-TALLY TREE SPECIES COVER LAYER 4	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
NON-TALLY TREE SPECIES COVER – AERIAL VIEW	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 1	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 2	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 3	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
SHRUB, SUBSHRUB, AND WOODY VINE COVER LAYER 4	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
SHRUB, SUBSHRUB, AND WOODY VINE COVER – AERIAL VIEW	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
FORB COVER LAYER 1	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
FORB COVER LAYER 2	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
FORB COVER LAYER 3	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
FORB COVER LAYER 4	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
FORB COVER LAYER – AERIAL VIEW	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
GRAMINOID COVER LAYER 1	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
GRAMINOID COVER LAYER 2	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
GRAMINOID COVER LAYER 3	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
GRAMINOID COVER LAYER 4	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
GRAMINOID COVER LAYER – AERIAL VIEW	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*000-100*	*percent*	3 digits	*Any accessible measured land condition (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) when P2 vegetation is being sampled on the subplot (P2 VEG SUBPLOT SAMPLE STATUS = 1)*
SPECIES GROWTH HABIT	*No errors*	*At least 95% of the time*	*SD, SH, FB, GR, LT*	*N/A*	*2 alphanumeric characters*	*LEVEL OF DETAIL = 2 or 3, and for each species recorded*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
SPECIES CODE	*No errors*	*At least 80% of the time*	Accepted NRCS species code when the species is known, or an accepted NRCS genus or unknown code when the species is not known	*N/A*	*8 alphanumeric characters*	*LEVEL OF DETAIL = 2 or 3 and species total aerial canopy cover on the full subplot and within a SPECIES GROWTH HABIT is 3% or greater.*
UNIQUE SPECIES NUMBER	*No errors*	*At least 99% of the time*	*1-99, assigned in sequential numbers*	*N/A*	*2 digits*	*All species recorded*
SPECIES CANOPY COVER	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*001-100*	*percent*	3 digits	*For each plant species present on the subplot with total aerial canopy cover greater than or equal to 3% within a SPECIES GROWTH HABIT. A plant species is defined as a unique SPECIES CODE and UNIQUE SPECIES NUMBER pair.*
SPECIES VEGETATION LAYER	*No errors*	*At least 90% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*For each species recorded*
SPECIMEN OFFICIALLY COLLECTED	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*All species recorded*
SPECIMEN LABEL NUMBER	*No errors*	*At least 99% of the time*	*1 to 99999, as pre-printed and assigned by region or auto-generated in the PDR*	*N/A*	*5 digits*	*SPECIMEN OFFICIALLY COLLECTED = 1*
P2 SPECIMEN NOT COLLECTED REASON CODE	*No errors*	*At least 99% of the time*	*01, 02, 03, 04, 05, 06, 07, 10*	*N/A*	*2 digits*	*An unknown code or genus code is entered and SPECIMEN OFFICIALLY COLLECTED = 0*
VEGETATION SPECIES NOTES	*N/A*	*N/A*	*English language words, phrases, and numbers*	*N/A*	*unlimited alphanumeric character field*	*As needed*
Invasive Plants						
SUBPLOT NUMBER	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*On all subplots where INVASIVE PLANT SAMPLING STATUS = 1 or 2*
CONDITION CLASS NUMBER	*No errors*	*At least 99% of the time*	*1-9*	*N/A*	*1 digit*	*Any accessible measured land condition within subplots (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS =2) when invasive plants are being sampled on the subplot (INVASIVE PLANT SUBPLOT SAMPLE STATUS=1 or 2)*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
SPECIES CODE	*No errors*	*At least 99% of the time*	*Accepted NRCS species code from the appropriate list for the unit when the species is known, or a NRCS unknown code when the species is not known.*	*N/A*	*8 alphanumeric characters*	*Any accessible measured land condition within subplots (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS =2) when invasive plants are being sampled on the subplot (INVASIVE PLANT SUBPLOT SAMPLE STATUS=1 or 2)*
UNIQUE SPECIES NUMBER	*No errors*	*At least 99% of the time*	*1-99, assigned in sequential numbers*	*N/A*	*2 digits*	*All species records*
SPECIES CANOPY COVER	*+/- 1 class based on the following canopy cover classes: 1%, 2-5%, 6-10%, 11-25%, 26-50%, 51-75%, 76-95%, 96-100%*	*At least 90% of the time*	*001-100*	*percent*	3 digits	*All species records*
INVASIVE SPECIMEN COLLECTED	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*All species records when INVASIVE PLANT SPECIMEN COLLECTION RULE = 1*
SPECIMEN LABEL NUMBER	*No errors*	*At least 99% of the time*	*1 to 99999, as pre-printed and assigned by FIA unit*	*N/A*	*5 digits*	*Where INVASIVE SPECIMEN COLLECTED=1*
INVASIVE PLANT NOTES	*N/A*	*N/A*	*English language words, phrases, and numbers*	*N/A*	*Unlimited alphanumeric character field*	*Required for each record with an unknown code and SPECIMEN LABEL NUMBER.*
Down Woody Materials						
SUBPLOT NUMBER	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All transect segments on plots where DWM SAMPLING STATUS >0*
TRANSECT (BASE)	*No errors*	*At least 99% of the time*	*Subplot 1: 090, 270, 180* *Subplot 2: 360, 180, 270* *Subplot 3: 135, 315, 225* *Subplot 4: 045, 225, 315* **extra optional transect*	*degrees*	*3 digits*	*All transect segments where DWM SAMPLING STATUS > 0*
SEGMENT CONDITION CLASS NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1 to 9*	*N/A*	*1 digit*	*All transect segments where DWM SAMPLING STATUS >0*
SEGMENT BEGINNING DISTANCE (BASE)	*+/- 1 ft.*	*At least 95% of the time*	*00.0 to 58.9*	*horizontal feet*	*3 digits (xx.y)*	*All transect segments where DWM SAMPLING STATUS >0*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
SEGMENT ENDING DISTANCE (BASE)	*+/- 1 ft.*	*At least 95% of the time*	*00.1 to 58.9*	*horizontal feet*	*3 digits (xx.y)*	*All transect segments where DWM SAMPLING STATUS >0*
DWM TRANSECT SEGMENT SAMPLE STATUS (BASE)	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*All transect segments where DWM SAMPLING STATUS >0*
DWM TRANSECT SEGMENT NONSAMPLED REASON (BASE)	*No errors*	*At least 99% of the time*	*04, 05,10*	*N/A*	*2 digits*	*All transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 0*
SUBPLOT NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 OR NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
TRANSECT (BASE)	*No errors*	*At least 99% of the time*	*Subplot 1: 090, 270, 180* *Subplot 2: 360, 180, 270* *Subplot 3: 135, 315, 225* *Subplot 4: 045, 225, 315* **extra optional transect*	*degrees*	*3 digits*	*All tally pieces where DWM TRANSECT SAMPLE STATUS = 1*
CWD CONDITION CLASS (BASE)	*No errors*	*At least 90% of the time*	*1 to 9*	*N/A*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST C0NDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
PIECE ON SUBPLOT OR ANNULAR PLOT? (BASE)	*No errors*	*At least 90% of the time*	*1, 2*	*N/A*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST C0NDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
*CWD HORIZONTAL DISTANCE (WILDLIFE OPTION)**	*+/- 1.0 ft.*	*At least 90% of the time*	*00.0 to 58.9*	*feet*	*3 digits (xx.y)*	*WILDLIFE: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and DWM SAMPLING STATUS =2* *OPTIONAL: All tally pieces in CONDITION CLASS STATUS =1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and DWM SAMPLING STATUS = 1 or 3*
CWD DECAY CLASS (BASE)	*+/- 1 class*	*At least 90% of the time*	*1, 2, 3, 4, 5*	*class*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
SPECIES (BASE)	*No errors*	*At least 80% of the time*	*See appendix 3*	*N/A*	*4 digits*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4*
DIAMETER AT POINT OF INTERSECTION (BASE)	*Pieces <20.0 inches diameter: +/- 1 inch for decay class 1-4, +/- 2 inches for decay class 5* *Pieces ≥ 20.0 inches diameter (decay classes 1-4): +/- 2 inches for each 20-inch increment >20.0 inches* *Pieces ≥ 20.0 inches diameter (decay class 5): +/- 3 inches for each 20-inch increment above 20.0 inches*	*At least 90% of the time*	*003 to 200*	*inches*	*3 digits*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
DIAMETER OF HOLLOW AT POINT OF INTERSECTION (BASE)	*Pieces < 20.0 inches diameter: +/- 1 inch* *Pieces ≥ 20.0 inches diameter: +/- 2 inches for each 20-inch increment above 20.0 inches*	*At least 80% of the time*	*000, 001 to 200*	*inches*	*3 digits*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4*
DIAMETER AT THE SMALL END (WILDLIFE OPTION)	*Pieces < 20.0 inches diameter: +/- 1 inch* *Pieces > 20.0 inches diameter: +/- 2 inches for each 20-inch increment above 20.0 inches*	*At least 90% of the time*	*003 to 200*	*Inches*	*3 digits*	*WILDLIFE: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CANDITION CLASS STATUS = 2, where DWM SAMPLING STATUS = 2, DWM TRANSECT SEGMENT SAMPLE STATUS = 1, CWD DECAY CLASS = 1 to 4, and CWD LENGTH ≥3 FEET = 1* *OPTIONAL: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CANDITION CLASS STATUS = 2, where DWM SAMPLING STATUS = 1 or 3, DWM TRANSECT SEGMENT SAMPLE STATUS = 1, CWD DECAY CLASS = 1 to 4, and CWD LENGTH ≥3 FEET = 1*
DIAMETER AT THE LARGE END (WILDLIFE OPTION)	*Pieces < 20.0 inches diameter: +/- 1 inch* *Pieces > 20.0 inches diameter: +/- 2 inches for each 20-inch increment above 20.0 inches*	*At least 90% of the time*	*003 to 250*	*Inches*	*3 digits*	*WILDLIFE: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM SAMPLING STATUS = 2, DWM TRANSECT SEGMENT SAMPLE STATUS = 1, CWD DECAY CLASS = 1 to 4, and CWD LENGTH ≥3 FEET = 1* *OPTIONAL: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM SAMPLING STATUS = 1 or 3, DWM TRANSECT SEGMENT SAMPLE STATUS = 1, CWD DECAY CLASS = 1 to 4, and CWD LENGTH ≥3 FEET = 1*
CWD LENGTH >= 3 FEET (BASE)	*+/- 20%*	*At least 90% of the time*	*1, 2*	*N/A*	*1 digit*	*All tally pieces >0.5 foot long, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
CWD TOTAL LENGTH (WILDLIFE OPTION)	*+/- 20%*	*At least 90% of the time*	*003 to 250*	*feet*	*3 digits*	*WILDLIFE: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM SAMPLING STATUS = 2, DWM TRANSECT SEGMENT SAMPLE STATUS = 1, and CWD LENGTH ≥3 FEET = 1 OPTIONAL: All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM SAMPLING STATUS = 1 or 3, DWM TRANSECT SEGMENT SAMPLE STATUS = 1, and CWD LENGTH ≥3 FEET = 1*
IS THE PIECE HOLLOW? (OPTIONAL)	*No errors*	*At least 90% of the time*	*0, 1*	*N/A*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4 and CWD LENGTH >=3 FEET = 1*
PIECE INCLINATION (OPTIONAL)	*+/- 5 degrees*	*At least 90% of the time*	*00 to 90*	*degrees*	*2 digits*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
CWD HISTORY (OPTIONAL)	*No errors*	*At least 90% of the time*	*1, 2, 3, 4, 5*	*N/A*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4*
PERCENT OF LOG CHARRED BY FIRE (OPTIONAL)	*+/- 1 class*	*At least 90% of the time*	*0, 1, 2, 3*	*class*	*1 digit*	*All tally pieces in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1, DIAMETER AT POINT OF INTERSECTION >20, and CWD DECAY CLASS = 1 to 3*
LARGE END DIAMETER CLASS (OPTIONAL)	*No errors*	*At least 90% of the time*	*1, 2, 3, 4, 5, 6*	*N/A*	*1 digit*	*All tally pieces where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and CWD DECAY CLASS = 1 to 4*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
PILE SUBPLOT NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
PILE TRANSECT (BASE)	*No errors*	*At least 99% of the time*	*Subplot 1: 090, 270, 180* Subplot 2: 360, 180, 270* Subplot 3: 135, 315, 225* Subplot 4: 045, 225, 315* *extra optional transect*	*N/A*	*3 digits*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
PILE CONDITION CLASS NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1 to 9*	*N/A*	*1 digit*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
PILE BEGINNING DISTANCE (BASE)	*+/- 10 %*	*At least 90% of the time*	*00.0 to 58.8*	*feet*	*3 digits (xx.y)*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
PILE ENDING DISTANCE (BASE)	*+/- 10%*	*At least 90% of the time*	*00.1 to 58.9*	*feet*	*3 digits (xx.y)*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
COMPACTED HEIGHT OF CWD IN PILE (BASE)	*+/- 10%*	*At least 90% of the time*	*1 to 99*	*feet*	*2 digits*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
PILE DECAY CLASS (BASE)	*+/- 1 decay class*	*At least 90% of the time*	*1, 2, 3, 4, 5*	*class*	*1 digit*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
PILE SPECIES (BASE)	*No errors*	*At least 90% of the time*	*See appendix 3*	*N/A*	*4 digits*	*All sampled residue piles on transects in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2, where DWM TRANSECT SEGMENT SAMPLE STATUS = 1 and PILE DECAY CLASS = 1 to 4*
FWD SUBPLOT NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
FWD TRANSECT (BASE)	*No errors*	*At least 99% of the time*	*Subplot 1: 270* *Subplot 2: 360* *Subplot 3: 135* *Subplot 4: 225*	*N/A*	*3 digits*	*All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
FWD CONDITION CLASS NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1 to 9*	*N/A*	*1 digit*	*All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
FWD TRANSECT SEGMENT SAMPLE STATUS (BASE)	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*All FWD transect segments where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
FWD TRANSECT SEGMENT NONSAMPLED REASON (BASE)	*No errors*	*At least 99% of the time*	*04, 05, 10*	*N/A*	*2 digits*	*All FWD transect segments where FWD TRANSECT SEGMENT SAMPLE STATUS = 0*
SMALL FWD COUNT (BASE)	*0 to 50 = +/- 20% of the total count for the transect* *51 to 100 = +/- 25% of the total count for the transect* *100 + = +/- 50% of the total count for the transect*	*At least 90% of the time*	*000 to 999*	*pieces*	*3 digits*	*All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1*
MEDIUM FWD COUNT (BASE)	*+/- 20% of the total count for the transect*	*At least 90% of the time*	*000 to 999*	*pieces*	*3 digits*	*All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1*
LARGE FWD COUNT (BASE)	*+/- 20% of the total count for the transect*	*At least 90% of the time*	*000 to 500*	*pieces*	*3 digits*	*All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1*

Variable Name	Tolerance	MQO	Values	Units	Field Width	When Collected
HIGH COUNT REASON (BASE)	*No errors*	*At least 90% of the time*	*1, 2, 3, 4, 5*	*N/A*	*1 digit*	*All FWD transect segments in CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2 where FWD TRANSECT SEGMENT SAMPLE STATUS = 1 and (SMALL FWD COUNT ≥ 100 or MEDIUM FWD COUNT ≥100 or LARGE FWD COUNT ≥100*
DUFF/LITTER SUBPLOT NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
DUFF/LITTER TRANSECT (BASE)	*No errors*	*At least 99% of the time*	*Subplot 1: 090, 270 Subplot 2: 360, 180 Subplot 3: 135, 315 Subplot 4: 045, 225*	*degrees*	*3 digits*	*All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
DUFF/LITTER CONDITION CLASS NUMBER (BASE)	*No errors*	*At least 99% of the time*	*1 to 9*	*N/A*	*1 digit*	*All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
DUFF/LITTER SAMPLE STATUS (BASE)	*No errors*	*At least 99% of the time*	*0, 1*	*N/A*	*1 digit*	*All duff/litter transects where DWM TRANSECT SEGMENT SAMPLE STATUS = 1*
DUFF/LITTER NONSAMPLED REASON (BASE)	*No errors*	*At least 99% of the time*	*04, 05, 10*	*N/A*	*2 digits*	*All duff/litter transects where DUFF/LITTER SAMPLE STATUS = 0*
DUFF DEPTH (BASE)	*+/- 0.5 inch*	*At least 90% of the time*	*00.0 to 24.0*	*inches*	*3 digits*	*All duff/litter transects in measureable conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) where DUFF/LITTER SAMPLE STATUS = 1*
LITTER DEPTH (BASE)	*+/- 0.5 inch*	*At least 90% of the time*	*00.0 to 99.9*	*Inches*	*3 digits*	*All duff/litter transects in measureable conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) where DUFF/LITTER SAMPLE STATUS = 1*
DUFF AND LITTER METHOD (BASE)	*No errors*	*At least 90% of the time*	*1, 2, 3, 4*	*N/A*	*1 digit*	*All duff/litter transects in measureable conditions (CONDITION CLASS STATUS = 1 or NONFOREST CONDITION CLASS STATUS = 2) where DUFF/LITTER SAMPLE STATUS*

Appendix 8. Tree Coding Guide

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
	SAMPLE KIND 1 or 3						
1		Live 1.0+ DBH/DRC	-	1			
2		Standing dead 1.0+ DBH/DRC	-	2		Null – Office inserts code 1	Core optional
	SAMPLE KIND 2 (Remeasure) Changes in Present Tree Status, Diameter or Location from Microplot to Subplot						
3	Live 5.0+ DBH/DRC	Live 5.0+ DBH/DRC	1	1			
4	Live 1.0-4.9 DBH/DRC on microplot	Live 5.0+ DBH/DRC Note: this live tally tree should be referenced with a new distance and azimuth from the subplot center.	1	1			
5	Live 1.0-4.9 DBH/DRC on microplot	Live 1.0-4.9 DBH/DRC on microplot	1	1			
6	Live 1.0+ DBH/DRC	Standing dead 5.0+ DBH/DRC	1	2		1	10-80
7	Live 5.0+ DBH/DRC	Down dead 5.0+ DBH/DRC	1	2		0	10-80
8	Live 1.0-4.9 DBH/DRC on microplot	Dead 5.0+ DBH/DRC (standing or down) Note: if standing, this dead tally tree should be referenced with a new distance and azimuth from the subplot center.	1	2		0 or 1	10-80
9	Live 1.0+ DBH/DRC	Cut and left in the woods	1	2		0	80
10	Live 1.0+ DBH/DRC	Tree removed (cut and hauled away)	1	3			80
11	Dead 5.0+ DBH/DRC	Dead standing 5.0 DBH/DRC	2	2		1	
12	Dead 5.0+ DBH/DRC	Dead down 5.0+ DBH/DRC	2	2		0	
13	Dead 5.0+ DBH/DRC	Tree removed (cut and hauled away)	2	3			
14	< 5.0 live DBH/DRC	5.0+ DBH/DRC live (not on the microplot)		1	1		
15	< 1.0 live DBH/DRC	1.0-4.9 DBH/DRC live (on the microplot)		1	1		
16	< 1.0 live DBH/DRC	Standing dead 1.0-4.9 DBH/DRC on microplot	1	2	1	1	10-80

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
17	< 1.0 live DBH/DRC	5.0+ DBH/DRC live (through growth on the microplot)		1	2		
18	< 5.0 live DBH/DRC	5.0+ DBH/DRC dead (standing, not on the microplot)	1	2	1	1	10-80
19	< 5.0 live DBH/DRC	5.0+ DBH/DRC dead (standing or down, on the microplot)	1	2		0 or 1	10-80
	SAMPLE KIND 2 (Remeasure) Shrinking Diameter Scenarios						
20	Dead 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot)	2	2		0	
21	Dead 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead located on microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center	2	2		1	
22	Live 5.0+ DBH/DRC	Tree shrank <5.0 and live, NOT on microplot	1	0	5		
23	Live 5.0+ DBH/DRC	Live but shrank < 5.0 and on microplot Note: this live sapling should be referenced with a new distance and azimuth from the microplot center.	1	1			
24	Live 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead, located on subplot (not located on microplot)	1	2		0	10-80
25	Live 5.0+ DBH/DRC	Tree shrank <5.0 but ≥ 1.0 (e.g., bark loss) and is standing dead located on microplot. Note: this dead sapling should be referenced with a new distance and azimuth from the microplot center	1	2		1	10-80
26	Live 1.0-4.9 DBH/DRC	Tree shrank <1.0 and live	1	0	5		
27	Live 1.0 – 4.9 DBH/DRC	Tree shrank <1.0 and dead	1	2		0	10-80
	SAMPLE KIND 2 (Remeasure) Trees Moving On or Off Subplots and Microplots						
28	Live 1.0+ DBH/DRC	Tree moved off plot/microplot due to a geologic (e.g., slight earth movement) or weather event (e.g., hurricane) and you can still see it (live before, live now)	1	0	6		

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
29	Live 1.0+ DBH/DRC	Cruiser unable to locate tree due to a weather, geologic (such as landslide), or fire event & assume tree is down dead **or** you can see tree is dead and down, and off the plot	1	2		0	30 or 50
30	Dead 5.0 DBH/DRC	Tree moved off plot due to a geologic (e.g., small earth movement) or weather event (e.g., hurricane) and you can still see the tree is standing dead	2	0	6		
31	Dead 5.0+ DBH/DRC	Cruiser is unable to locate tree due to a weather, geologic (such as landslide), or fire event & assume it is down dead or you can see tree and it is down dead and off the plot	2	2		0	
32	No status	Live tree moved onto plot due to a geologic (e.g. small earth movement) or weather event (e.g. hurricane)		1	6		
33	No Status	Previously live tree moved onto plot due to a geologic (e.g. small earth movement) or weather event (e.g. hurricane) and now dead	1	2	6	1	10-80
34	No Status	Previously dead tree moved onto plot due to a geologic (e.g. small earth movement) or weather event (e.g. hurricane)	2	2	6	1	
	SAMPLE KIND 2 (Remeasure) Added or Missed Trees						
35	Live 1.0-4.9 DBH/DRC	Live 1.0-4.9 DBH/DRC, shouldn't have been tallied—beyond 6.8—cruiser error	1	0	7		
36	Live or dead 5.0+ DBH/DRC	Live or dead 5.0+ DBH/DRC, shouldn't have been tallied –beyond 24.0—cruiser error	1 or 2	0	7		
37	Live or dead 24.0/30.0+ DBH/DRC	Live or dead 24.0/30.0+ DBH/DRC, shouldn't have been tallied–beyond 58.9—cruiser error	1 or 2	0	7		
38	Live 1.0+ DBH/DRC	Live 1.0+ DBH/DRC, shouldn't have been tallied—not a tally species—cruiser error	1	0	7		
39	Dead 5.0+ DBH/DRC	Dead 5.0+ DBH/DRC, shouldn't have been tallied—not a tally species—cruiser error	2	0	7		

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
40	No Status	Live 1.0+ DBH/DRC, should have been tallied—was a tally species—cruiser error		1	7		
41	No Status	Dead 5.0+ DBH/DRC, should have been tallied—was a tally species previously alive—cruiser error	1	2	7	1	10-80
42	No Status	Dead 5.0+ DBH/DRC, should have been tallied—was a tally species previously standing dead—cruiser error	2	2	7	1	
	SAMPLE KIND 2 (Remeasure) Tally Species Change						
43	Live 1.0+ DBH/DRC	No longer a tally species (alive or dead)	1	0	8		
44	Dead 5.0+ DBH/DRC	No longer a tally species	2	0	8		
45	No Status	Live tree now on tally tree species list		1	8		
46	No Status	Standing Dead tree now on tally tree species list and previously alive	1	2	8	1	10-80
47	No Status	Standing Dead tree now on tally tree species list and previously dead	2	2	8	1	
	SAMPLE KIND 2 (Remeasure) Forest and Nonforest Land Changes						
48	Live 1.0+	Live tree status but land no longer qualifies as forest	1	1			
49	Live 1.0 + DBH/DRC	Dead (standing or down) and land no longer qualifies as forest (land clearing or conversion to nonforest land use)	1	2		0 or 1	10-80
50	Live 1.0+ DBH/DRC	Gone (cut and removed) and land no longer qualifies as forest	1	3			80
51	Nonforest before	Forest now, Live 1.0+ DBH/DRC		1	1		
52	Nonforest before	Forest now, Previously live, now Standing Dead 1.0+ DBH/DRC	1	2	1	1	10-80
53	Nonforest before	Forest now, Previously dead, now Standing Dead 1.0+ DBH/DRC	2	2	1	1	
	SAMPLE KIND 2 (Remeasure) Plots with Nonforest Inventories (NONFOREST SAMPLING STATUS = 1)						

	Previous Measurement	Present Measurement	PREVIOUS TREE STATUS	PRESENT TREE STATUS	RECONCILE	STANDING DEAD	CAUSE OF DEATH
54	Non-measurable nonforest before, <1.0 live DBH/DRC	Measurable nonforest now, Live 1.0+ DBH/DRC		1	8		
55	Non-measurable nonforest before, 1.0+ live DBH/DRC	Measurable nonforest now, Live 1.0+ DBH/DRC		1	8		
56	Non-measurable nonforest before	Measurable nonforest now, Standing Dead 1.0+ DBH/DRC	1	2	8	1	10-80
57	Non-measurable nonforest before	Measurable nonforest now, Standing Dead 1.0+ DBH/DRC	2	2	8	1	
	SAMPLE KIND 2 (Remeasure) Sampled and Nonsampled Changes						
58	Live 1.0+ DBH/DRC	Nonsampled area now	1	0	9		
59	Dead 5.0+ DBH/DRC	Nonsampled area now	2	0	9		
60	Nonsampled area before	Live 1.0 + DBH/DRC		1	9		
61	Nonsampled area before (tree was previously alive)	Standing Dead 1.0+ DBH/DRC	1	2	9	1	10-80
62	Nonsampled area before (tree was previously dead)	Standing Dead 1.0+ DBH/DRC	2	2	9	1	

Note: After completion of 1 cycle with the new standing dead sapling protocols, additional tree coding combinations will be applicable.

Appendix 9. Invasive Plant List

To obtain a current invasive plant list, contact the local region for the appropriate list.

Appendix 10. Unknown Plant Specimen Collection

The following information describes some useful procedures and examples of data-collection aids for collecting plant specimens. The preferred option is to use procedures developed for the P3 Vegetation Indicator protocol which relies on automated data-recorder and database tracking of plant specimens. This protocol also automates the creation of labels for specimens that can be downloaded and printed.

If your unit requires collection of plant specimens for species that:

1) you cannot identify quickly and confidently using field guides but are potentially identifiable, or

2) are a new record for the state,

follow these basic steps:

1. Assign a valid SPECIES CODE.
2. Record whether or not a specimen was collected in the appropriate SPECIMEN COLLECTED variable.
3. When a specimen is collected, enter a SPECIMEN LABEL NUMBER. Place a label with the corresponding label number in the bag with the specimen.
4. Describe any newly encountered unknown species in the appropriate NOTES variable.
5. Record the canopy cover estimates of the unknown species on the condition on the subplot where encountered.

Example Field Specimen Label
Where specimen collection is part of the protocol, each crew may be issued a set of printed labels to track unknown specimens. The information to be completed by hand in the field is optional, but may include date, unknown code, unique species number and crew name.

Label Number:**1**
Date: *8/06/06*
Unknown Code:*ACANT2* Unique Species Nbr:*1*
Veg Spec. crew: *John Doe*

Example Specimen Label
Official specimen labels are printed from plot data collected in the data-recorder (PDR) and accompany the unknown specimen as it is pressed, dried and submitted for further identification. Labels will not include sensitive plot identification data – the unique specimen label number is sufficient identification for each specimen.

Specimen Label

State: Ohio **County:** Lawrence

Plot:

Label Number: 21 **Resolved Species Code:**

Resolved scientific name:

Resolved by (name):

Date Collected: 6/22/2005

Unknown Code: 2GRAM **Unique Species Nbr:** 7

Field collected scientific name:

Collected by: (name or number)

Community type(s) where found: bottomland, old stripmine
ridgetop with atv trl, stripped yrs ago moist bottom

Collecting and pressing plants
If fewer than 5 individuals of an unknown herbaceous plant species are present **do not collect**.

Use a digging tool to extract the entire plant, including any underground portions, flowers, fruits, and leaves. If the plant is abundant, collection of two samples will increase the likelihood of a good specimen.

Collected unknown specimens should be transported in the field and from the field in the 1 and/or 2 gallon zip-lock bags provided. Only one species and label may be placed in a single bag. Acceptable methods of transporting collected specimens include:

- Use a 3-hole-punch to punch holes in the bottom of your bags prior to traveling in the field. Place the punched bags into a 2-inch 3-ring binder with the zip-lock portion facing outward. Plants can then be placed with labels into the bag directly in the binder. This method prevents crumpling, tearing, and destroying the specimen during transportation.
- Use a 1-hole-punch to punch a hole in the one upper corner of each bag. The hole should be placed in such a manner that it cannot easily be torn. Place the bags on an aluminum carabineer (available at drug stores) or on heavy twine and fasten to your field vest or backpack. Be careful to seal the plants and labels securely inside the bags to prevent accidental loss.

Press and label the plant if not identified by the end of the day:

A. After returning to the field office print all of the labels associated with the collected unknown specimens. The printed labels should now have all of the plot information (plot number, state, notes, unknown code, etc.) in addition to the original label number, make sure that the printed information is correct and matches the unknown specimen before including it in the press.

B. Each specimen representing a unique species should be placed individually inside a single layer of folded newsprint. Each specimen is to be accompanied by its corresponding unknown specimen label. Small plant specimens are to be pressed individually. Large plant specimens may be folded in a “v”, “z”, or “w” arrangement to fit on a single newsprint page. Arrange the specimen so that at least one upper and one lower leaf surface is exposed. Plants may be trimmed to reduce bulk, so long as all diagnostic parts are included. Diagnostic portions include stem sections, petioles, leaves, roots, flowers, and fruits. Bulky fruits or nuts may be stored separately in a paper envelope that is taped to the newsprint and

is accompanied by an identical copy of the specimen's unknown label. Unknown codes can be written on the outside of the folded newspaper to aid sorting as specimens are processed.

C. Stack the specimens in their individual newsprint sleeves between two pieces of cardboard. Bind the cardboard and plants together using a piece of twine or flat cloth ribbon wrapped around the length and width of the cardboard bundle. For mailing numerous specimens, several bundles may be used. Place all bundles inside a cardboard box for shipping.

Package and submit specimens as dictated by your FIA unit or lab. It is suggested that Unknown specimens be packaged and shipped at the end of every work week. Exceptions will be made when extended field excursions prevent the vegetation specialist from reaching a post office.

All packaged specimens are to be accompanied by a legible completed label. Unknown Spreadsheets tracking collected unknown plants are generated from the PDR plot file.

Appendix 11. Damage Codes

The REGION column means that only the region(s) listed are allowed to collect the specific code, and must do so when the damage is present and meets or exceeds the required threshold. Note: PNW indicates the code is applicable to all of the region including Alaska. PNW-AK indicates the code is applicable to Alaska only.

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
00000			No damage				**ALL**
10000	**10**	**000**	**General Insects**			Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
10001	10	001	thrips		General Insects		
10002	10	002	Pine tip moth		General Insects		
10003	10	003	wasp		General Insects		
10004	10	004	Chinese rose beetle	Adoretus sinicus	General Insects		
10005	10	005	rose beetle	Adoretus versutus	General Insects		
10006	10	006	coconut hispid beetle	Brontispa longissima	General Insects		
10007	10	007	clerid beetle	Cleridae	General Insects		
10008	10	008	weevil	Curculionidae	General Insects		
10009	10	009	green rose chafer	Dichelonyx backi	General Insects		
10010	10	010	Allegheny mound ant	Formica exsectoides	General Insects		
10011	10	011	ant	Formicidae	General Insects		
10012	10	012	stick insect	Graeffea crovanii	General Insects		
10013	10	013	Hulodes cranea	Hulodes cranea	General Insects		
10014	10	014	conifer swift moth	Korsheltellus gracilis	General Insects		
10015	10	015	Caroline shortnosed weevil	Lophothetes spp.	General Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
10016	10	016	coconut rhinoceros beetle	Oryctes rhinoceros	General Insects	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW**
10017	10	017	bagworm moth	Psychidae	General Insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
10018	10	018	coconut palm weevil	Rhobdoscelus asperipennis	General Insects		
10019	10	019	scarab	Scarabaeidae	General Insects		
10020	10	020	ash white fly	Siphoninus phillyreae	General Insects		
10021	10	021	conifer seedling weevil	Steremnius carinatus	General Insects		
10022	10	022	pyralid moth	Thliptoceras octoquttale	General Insects		
10023	10	023	wood wasps	Siricidae spp.	General Insects		
11000	**11**	**000**	**Bark Beetles**			Any evidence of a successful attack (successful attacks generally exhibit boring dust, many pitch tubes and/or fading crowns)	**ALL**
11001	11	001	roundheaded pine beetle	Dendroctonus adjunctus	Bark Beetles		
11002	11	002	western pine beetle	Dendroctonus brevicomis	Bark Beetles		
11003	11	003	southern pine beetle	Dendroctonus frontalis	Bark Beetles		
11004	11	004	Jeffery pine beetle	Dendroctonus jeffreyi	Bark Beetles		
11005	11	005	lodgepole pine beetle	Dendroctonus murrayanae	Bark Beetles		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
11006	11	006	mountain pine beetle	Dendroctonus ponderosae	Bark Beetles	Any evidence of a successful attack	**IW; NRS**
11007	11	007	Douglas-fir beetle	Dendroctonus pseudotsugae	Bark Beetles		
11008	11	008	Allegheny spruce beetle	Dendroctonus punctatus	Bark Beetles		
11009	11	009	spruce beetle	Dendroctonus rufipennis	Bark Beetles	Any evidence of a successful attack	**IW; PNW**
11010	11	010	eastern larch beetle	Dendroctonus simplex	Bark Beetles		
11011	11	011	black turpentine beetle	Dendroctonus terebrans	Bark Beetles		
11012	11	012	red turpentine beetle	Dendroctonus valens	Bark Beetles	Any evidence of a successful attack	**NRS**
11013	11	013	Dryocoetes affaber	Dryocoetes affaber	Bark Beetles		
11014	11	014	Dryocoetes autographus	Dryocoetes autographus	Bark Beetles		
11015	11	015	western balsam bark beetle	Dryocoetes confusus	Bark Beetles		
11016	11	016	Dryocoetes sechelti	Dryocoetes sechelti	Bark Beetles		
11017	11	017	ash bark beetles	Hylesinus spp.	Bark Beetles		
11018	11	018	native elm bark beetle	Hylurgopinus rufipes	Bark Beetles		
11019	11	019	pinon ips	Ips confusus	Bark Beetles		
11020	11	020	small southern pine engraver	Ips avulsus	Bark Beetles		
11021	11	021	sixspined ips	Ips calligraphus	Bark Beetles		
11022	11	022	emarginate ips	Ips emarginatus	Bark Beetles		
11023	11	023	southern pine engraver beetle	Ips grandicollis	Bark Beetles		
11024	11	024	Orthotomicus latidens	Orthotomicus latidens	Bark Beetles		
11025	11	025	Arizona five-spined ips	Ips lecontei	Bark Beetles		
11026	11	026	Monterey pine ips	Ips mexicanus	Bark Beetles		
11027	11	027	California fivespined ips	Ips paraconfusus	Bark Beetles		
11028	11	028	northern spruce engraver beetle	Ips perturbatus	Bark Beetles		
11029	11	029	pine engraver	Ips pini	Bark Beetles		
11030	11	030	Ips engraver beetles	Ips spp.	Bark Beetles	Any evidence of a successful attack	**IW; NRS; PNW-AK**
11031	11	031	Ips tridens	Ips tridens	Bark Beetles		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
11032	11	032	western ash bark beetle	Leperisinus californicus	Bark Beetles		
11033	11	033	Oregon ash bark beetle	Leperisinus oregonus	Bark Beetles		
11034	11	034	Orthotomicus caelatus	Orthotomicus caelatus	Bark Beetles		
11035	11	035	cedar bark beetles	Phloeosinus spp.	Bark Beetles		
11036	11	036	western cedar bark beetle	Phloeosinus punctatus	Bark Beetles		
11037	11	037	tip beetles	Pityogenes spp.	Bark Beetles		
11038	11	038	Douglas-fir twig beetle	Pityophthorus pseudotsugae	Bark Beetles		
11039	11	039	twig beetles	Pityophthorus spp.	Bark Beetles		
11040	11	040	foureyed spruce bark beetle	Polygraphus rufipennis	Bark Beetles		
11041	11	041	fir root bark beetle	Pseudohylesinum granulatus	Bark Beetles		
11042	11	042	Pseudohylesinus dispar	Pseudohylesinus dispar	Bark Beetles		
11043	11	043	Douglas-fir pole beetle	Pseudohylesinus nebulosus	Bark Beetles		
11044	11	044	silver fir beetle	Pseudohylesinus sericeus	Bark Beetles		
11045	11	045	small European elm bark beetle	Scolytus multistriatus	Bark Beetles		
11046	11	046	spruce engraver	Scolytus piceae	Bark Beetles		
11047	11	047	hickory bark beetle	Scolytus quadrispinosus	Bark Beetles		
11048	11	048	true fir bark beetles	Scolytus spp.	Bark Beetles		
11049	11	049	Douglas-fir engraver	Scolytus unispinosus	Bark Beetles		
11050	11	050	fir engraver	Scolytus ventralis	Bark Beetles		
11051	11	051	striped ambrosia beetle	Tryachykele lineatum	Bark Beetles		
11052	11	052	Sitka spruce engraver beetle	Ips conncinnus	Bark Beetles		
11053	11	053	four-eyed bark beetle	Polygraphus spp.	Bark Beetles		
11054	11	054	hemlock beetle	Pseudohylesinus tsugae	Bark Beetles		
11055	11	055	spruce ips	Ips pilifrons	Bark Beetles		
11056	11	056	(smaller) Mexican pine beetle	Dendroctonus mexicanus	Bark Beetles		
11057	11	057	banded elm bark beetle	Scolytus schevyrewi	Bark Beetles		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
11058	11	058	redbay ambrosia beetle	Xyleborus glabratus	Bark Beetles		
11059	11	059	southern cypress beetle	Phloeosinus taxodii	Bark Beetles		
11060	11	060	Mediterranean pine engraver	Orthotomicus erosus	Bark Beetles		
11800	11	800	other bark beetle (known)	other bark beetle (known)	Bark Beetles		
11900	11	900	unknown bark beetle	unknown bark beetle	Bark Beetles		
11999	11	999	western bark beetle complex	western bark beetle complex	Bark Beetles		
12000	**12**	**000**	**Defoliators**			Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
12001	12	001	casebearer		Defoliators		
12002	12	002	leaftier		Defoliators		
12003	12	003	loopers		Defoliators		
12004	12	004	needleminers		Defoliators		
12005	12	005	sawflies		Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12006	12	006	skeletonizer		Defoliators		
12007	12	007	larger elm leaf beetle	Monocesta coryli	Defoliators		
12008	12	008	spanworm		Defoliators		
12009	12	009	webworm		Defoliators		
12010	12	010	pine false webworm	Acantholyda erythrocephala	Defoliators		
12011	12	011	western blackheaded budworm	Acleris gloverana	Defoliators		
12012	12	012	eastern blackheaded budworm	Acleris variana	Defoliators		
12013	12	013	whitefly	Aleyrodoidae	Defoliators		
12014	12	014	fall cankerworm	Alsophila pometaria	Defoliators		
12015	12	015	alder flea beetle	Altica ambiens	Defoliators		
12016	12	016	mountain mahogany looper	Anacamptodes clivinaria profanata	Defoliators		
12017	12	017	birch leaffolder	Ancylis disigerana	Defoliators		
12018	12	018	oak worms	Anisota spp.	Defoliators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12019	12	019	orange-striped oakworm	Anisota senatoria	Defoliators		
12020	12	020	western larch sawfly	Anoplonyx occidens	Defoliators		
12021	12	021	fruittree leafroller	Archips argyrospila	Defoliators		
12022	12	022	uglynest caterpillar	Archips cerasivorana	Defoliators		
12023	12	023	boxelder defoliator	Archips negundanus	Defoliators		
12024	12	024	oak leafroller	Archips semiferana	Defoliators		
12025	12	025	birch sawfly	Arge pectoralis	Defoliators		
12026	12	026	arborvitae leafminer	Argyresthia thuiella	Defoliators		
12027	12	027	coconut scale	Aspidiotus destructor	Defoliators		
12028	12	028	texas leafcutting ant	Atta texana	Defoliators		
12029	12	029	oak skeletonizer	Bucculatrix ainsliella	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12030	12	030	pear sawfly	Caliroa cerasi	Defoliators		
12031	12	031	scarlet oak sawfly	Caliroa quercuscoccineae	Defoliators		
12032	12	032	elm calligrapha	Calligrapha scalaris	Defoliators		
12033	12	033	boxelder leafroller	Caloptilia negundella	Defoliators		
12034	12	034	maple petiole borer	Caulocampus acericaulis	Defoliators		
12035	12	035	spruce webspinning sawfly	Cephalcia fascipennis	Defoliators		
12036	12	036	two-year budworm	Choristoneura biennis	Defoliators		
12037	12	037	large aspen tortrix	Choristoneura conflictana	Defoliators		
12038	12	038	spruce budworm	Choristoneura fumiferana	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12039	12	039	western pine budworm	Choristoneura lambertiana	Defoliators		
12040	12	040	western spruce budworm	Choristoneura occidentalis	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW, PNW**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12041	12	041	jack pine budworm	Choristoneura pinus	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12042	12	042	Modoc budworm	Choristoneura retiniana	Defoliators		
12043	12	043	aspen leaf beetle	Chrysomela crotchi	Defoliators		
12044	12	044	cottonwood leaf beetle	Chrysomela scripta	Defoliators		
12045	12	045	leafhopper	Cicadellidae	Defoliators		
12046	12	046	poplar tentmaker	Clostera inclusa	Defoliators		
12047	12	047	larch casebearer	Coleophora laricella	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12048	12	048	birch casebearer	Coleophora serratella	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12049	12	049	lodgepole needleminer	Coleotechnites milleri	Defoliators		
12050	12	050	Gelechiid moths/ needleminers	Coleotechnites spp.	Defoliators		
12051	12	051	Black Hills pandora moth	Coloradia doris	Defoliators		
12052	12	052	pandora moth	Coloradia pandora	Defoliators		
12053	12	053	sycamore lace bug	Corythucha ciliata	Defoliators		
12054	12	054	lace bugs	Corythucha spp.	Defoliators		
12055	12	055	oak leaftier	Croesia semipurpurana	Defoliators		
12056	12	056	dusky birch sawfly	Croesus latitarsus	Defoliators		
12057	12	057	walnut caterpillar	Datana integerrima	Defoliators		
12058	12	058	yellownecked caterpillar	Datana ministra	Defoliators		
12059	12	059	walkingstick	Diapheromera femorata	Defoliators		
12060	12	060	spruce coneworm	Dioryctria reniculelloides	Defoliators		
12061	12	061	introduced pine sawfly	Diprion similis	Defoliators		
12062	12	062	greenstriped mapleworm	Dryocampa rubicunda	Defoliators		
12063	12	063	spruce needleminer (east)	Endothenia albolineana	Defoliators		

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12064	12	064	elm spanworm	Ennomos subsignaris	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12065	12	065	maple trumpet skeletonizer	Epinotia aceriella	Defoliators		
12066	12	066	white fir needleminer	Epinotia meritana	Defoliators		
12067	12	067	linden looper	Erannis tiliaria	Defoliators		
12068	12	068	browntail moth	Euproctis chrysorrhoea	Defoliators	Any occurrence	**NRS**
12069	12	069	pine needleminer	Exoteleia pinifoliella	Defoliators		
12070	12	070	birch leafminer	Fenusa pusilla	Defoliators		
12071	12	071	elm leafminer	Fenusa ulmi	Defoliators		
12072	12	072	geometrid moth	Geometridae	Defoliators		
12073	12	073	leafblotch miner	Gracillariidae	Defoliators		
12074	12	074	spotted tussock moth	Halisidota maculata	Defoliators		
12075	12	075	pale tussock moth	Halysidota tessellaris	Defoliators		
12076	12	076	hesperiid moth	Hasora choromus	Defoliators		
12077	12	077	brown day moth	Hemileuca eglanterina	Defoliators		
12078	12	078	buck moth	Hemileuca maia	Defoliators		
12079	12	079	saddled prominent	Heterocampa guttivitta	Defoliators		
12080	12	080	variable oakleaf caterpillar	Heterocampa manteo	Defoliators		
12081	12	081	cherry scallop shell moth	Hydria prunivorata	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12082	12	082	fall webworm	Hyphantria cunea	Defoliators		
12083	12	083	hemlock looper	Lambdina fiscellaria	Defoliators		
12084	12	084	oak looper	Lambdina punctat	Defoliators		
12085	12	085	tent caterpillar moth	Lasiocampidae	Defoliators		
12086	12	086	satin moth	Leucoma salicis	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12087	12	087	willow leafblotch miner	Lithocolletis spp.	Defoliators		
12088	12	088	aspen blotchminer	Lithocolletis tremuloidiella	Defoliators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12089	12	089	gypsy moth	Lymantria dispar	Defoliators	Any occurrence	**NRS**
12090	12	090	cottonwood leafminers	Lyonetia spp.	Defoliators		
12091	12	091	dogwood sawfly	Macremphytus tarsatus	Defoliators		
12092	12	092	rose chafer	Macrodactylus subspinosus	Defoliators		
12093	12	093	eastern tent caterpillar	Malacosoma americanum	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12094	12	094	western tent caterpillar	Malacosoma californicum	Defoliators		
12095	12	095	Pacific tent caterpillar	Malacosoma constrictum	Defoliators		
12096	12	096	forest tent caterpillar	Malacosoma disstria	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**NRS**
12097	12	097	southwestern tent caterpillar	Malacosoma incurvum	Defoliators		
12098	12	098	leafcutting bees	Megachilidae	Defoliators		
12099	12	099	blister beetle	Meloidae	Defoliators		
12100	12	100	early birch leaf edgeminer	Messa nana	Defoliators		
12101	12	101	juniper sawfly	Monoctenus fulvus	Defoliators		
12102	12	102	common sawflies	Nematus spp.	Defoliators		
12103	12	103	balsam fir sawfly	Neodiprion abietis	Defoliators		
12104	12	104	lodgepole sawfly	Neodiprion burkei	Defoliators		
12105	12	105	blackheaded pine sawfly	Neodiprion excitans	Defoliators		
12106	12	106	pine infesting sawflies	Neodiprion fulviceps	Defoliators		
12107	12	107	redheaded pine sawfly	Neodiprion lecontei	Defoliators		
12109	12	109	ponderosa pine sawfly	Neodiprion mundus	Defoliators		
12110	12	110	white pine sawfly	Neodiprion pinetum	Defoliators		
12111	12	111	jack pine sawfly	Neodiprion pratti banksianae	Defoliators		
12112	12	112	Virginia pine sawfly	Neodiprion pratti pratti	Defoliators		
12113	12	113	European pine sawfly	Neodiprion sertifer	Defoliators		
12114	12	114	loblolly pine sawfly	Neodiprion taedae linearis	Defoliators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12115	12	115	hemlock sawfly	Neodiprion tsugae	Defoliators		
12116	12	116	pine butterfly	Neophasia menapia	Defoliators		
12117	12	117	false hemlock looper	Nepytia canosaria	Defoliators		
12118	12	118	California tortoiseshell	Nymphalis californica	Defoliators		
12119	12	119	locust leafminer	Odontota dorsalis	Defoliators		
12120	12	120	Bruce spanworm	Operophtera bruceata	Defoliators		
12121	12	121	rusty tussock moth	Orgyia antiqua	Defoliators		
12122	12	122	whitemarked tussock moth	Orgyia leucostigma	Defoliators		
12123	12	123	Douglas-fir tussock moth	Orgyia pseudotsugata	Defoliators		
12124	12	124	western tussock moth	Orgyia vetusta	Defoliators		
12125	12	125	spring cankerworm	Paleacrita vernata	Defoliators		
12126	12	126	black citrus swallowtail butterfly	Papilio polytes	Defoliators		
12127	12	127	maple leafcutter	Paraclemensia acerifoliella	Defoliators		
12128	12	128	pine tussock moth	Parorgyia grisefacta	Defoliators		
12129	12	129	poinciana looper	Pericyma cruegeri	Defoliators		
12130	12	130	half-wing geometer	Phigalia titea	Defoliators		
12131	12	131	Phoberia moth	Phoberia atomaris	Defoliators		
12132	12	132	California oakworm	Phryganidia californica	Defoliators		
12133	12	133	European snout beetle	Phyllobius oblongus	Defoliators		
12134	12	134	citrus leafminer	Phyllocnistis citrella	Defoliators		
12135	12	135	aspen leafminer	Phyllocnistis populiella	Defoliators	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**PNW-AK**
12136	12	136	yellowheaded spruce sawfly	Pikonema alaskensis	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12137	12	137	tenlined June beetle	Polyphylla decemlineata	Defoliators		
12138	12	138	Japanese beetle	Popillia japonica	Defoliators		
12139	12	139	larch sawfly	Pristiphora erichsonii	Defoliators		
12140	12	140	mountain-ash sawfly	Pristiphora geniculata	Defoliators		
12141	12	141	elm leaf beetle	Pyrrhalta luteola	Defoliators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12142	12	142	spearmarked black moth	Rheumaptera hastata	Defoliators		
12143	12	143	giant silkworm moth	Saturniidae	Defoliators		
12144	12	144	redhumped caterpillar	Schizura concinna	Defoliators		
12145	12	145	redbanded thrips	Selenothrips rubrocinctus	Defoliators		
12146	12	146	green larch looper	Semiothisa sexmaculata	Defoliators		
12147	12	147	maple leafroller	Sparganothis acerivorana	Defoliators		
12148	12	148	redhumped oakworm	Symmerista canicosta	Defoliators		
12149	12	149	orangehumped mapleworm	Symmerista leucitys	Defoliators		
12150	12	150	spruce needleminer (west)	Taniva albolineana	Defoliators		
12151	12	151	maple webworm	Tetralopha asperatella	Defoliators		
12152	12	152	pine webworm	Tetralopha robustella	Defoliators		
12153	12	153	introduced basswood thrips	Thrips calcaratus	Defoliators		
12154	12	154	bagworm	Thyridopteryx ephemeraeformis	Defoliators		
12155	12	155	leafroller/seed moth	Tortricidae	Defoliators		
12156	12	156	willow defoliation	Tortricidae	Defoliators		
12157	12	157	euonymus caterpillar	Yponomeuta spp.	Defoliators		
12158	12	158	spruce bud moth	Zeiraphera canadensis	Defoliators		
12159	12	159	larch bud moth	Zeiraphera improbana	Defoliators		
12160	12	160	pine needle sheathminer	Zelleria haimbachi	Defoliators		
12161	12	161	cypress looper	Anacamptodes pergracilis	Defoliators		
12162	12	162	Chrysomela leaf beetle	Chrysomela spp.	Defoliators		
12163	12	163	pine colaspis	Colaspis pini	Defoliators		
12164	12	164	saddleback looper	Ectropis crepuscularia	Defoliators		
12165	12	165	birch leaf roller	Epinotia solandriana	Defoliators	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**PNW-AK**
12166	12	166	New Mexico fir looper	Galenara consimilis	Defoliators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12167	12	167	striped alder sawfly	Hemichroa crocea	Defoliators		
12168	12	168	greenstriped looper	Melanoplophia imitata	Defoliators		
12169	12	169	willow leaf blotchminer	Micrurapteryx salicifoliella	Defoliators		
12170	12	170	pine sawfly	Neodiprion autmnalis	Defoliators		
12171	12	171	pinon sawfly	Neodiprion edulicolus	Defoliators		
12172	12	172	Neodiprion gilletti	Neodiprion gilletti	Defoliators		
12173	12	173	Neodiprion ventralis	Neodiprion ventralis	Defoliators		
12174	12	174	pine looper	Phaeoura mexicanaria	Defoliators		
12175	12	175	Zadiprion rohweri	Zadiprion rohweri	Defoliators		
12176	12	176	bull pine sawfly	Zadiprion townsendi	Defoliators		
12177	12	177	Douglas-fir budmoth	Zeiraphera hesperiana	Defoliators		
12178	12	178	western oak looper	Lambdina fiscellaria somniaria	Defoliators		
12179	12	179	phantom hemlock looper	Nepytia phantasmaria	Defoliators		
12180	12	180	tent caterpillar	Malacosoma spp.	Defoliators		
12181	12	181	Abbot's sawfly	Neodiprion abbotii	Defoliators		
12182	12	182	slash pine sawfly	Neodiprion merkeli	Defoliators		
12183	12	183	sand pine sawfly	Neodiprion pratti	Defoliators		
12184	12	184	melalueca leaf weevil	Oxyops vitiosa	Defoliators		
12185	12	185	cypress leaf beetle	Systena marginalis	Defoliators		
12186	12	186	Nepytia janetae	Nepytia janetae	Defoliators		
12187	12	187	agromyzid fly	Agromyza viridula	Defoliators		
12188	12	188	elm sawfly	Cimbex americana	Defoliators		
12189	12	189	june beetle	Phyllophaga spp.	Defoliators		
12190	12	190	hickory tussock moth	Halisidota caryae	Defoliators		
12191	12	191	pin oak sawfly	Caliroa lineata	Defoliators		
12192	12	192	palmerworm	Dichomeris ligulella	Defoliators		
12193	12	193	pitch pine looper	Lambdina athasaria pellucidaria	Defoliators		
12194	12	194	red pine sawfly	Neodiprion nanulus nanulus	Defoliators		
12195	12	195	pine tube moth	Argyrotaenia pinatubana	Defoliators		
12196	12	196	baldcypress leafroller	Archips goyerana	Defoliators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
12197	12	197	winter moth	Operophtera brumata	Defoliators	Any occurrence	**NRS**
12198	12	198	basswood thrips	Neohydatothrips tiliae	Defoliators		
12199	12	199	noctuid moth	Xylomyges simplex (Walker)	Defoliators		
12200	12	200	pyralid moth	Palpita magniferalis	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12201	12	201	pacific silver fir budmoth	Zeiraphera spp.	Defoliators		
12202	12	202	red pine needle midge	Thecodiplosis piniresinosae	Defoliators		
12203	12	203	western hemlock looper	Lambdina fiscellaria lugubrosa	Defoliators		
12204	12	204	lodgepole pine sawfly	Neodiprion nanulus contortae	Defoliators		
12205	12	205	silverspotted tiger moth	Lophocampa argentata	Defoliators		
12206	12	206	green alder sawfly	Monsoma pulveratum	Defoliators		
12207	12	207	conifer sawflies	conifer sawflies	Defoliators		
12208	12	208	ambermarked birch leafminer	Profenusa thomsoni	Defoliators		
12209	12	209	cycad blue butterfly	Chilades pandava	Defoliators		
12300	12	300	budworm	budworms	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW**
12800	12	800	other defloiater (known)	other defloiater (known)	Defoliators		
12900	12	900	unknown defoliator	unknown defoliator	Defoliators		
13000	**13**	**000**	**Chewing Insects**			Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS, IW**
13001	13	001	grasshopper		Chewing Insects		
13002	13	002	shorthorn grasshoppers	Acrididae	Chewing Insects		
13003	13	003	black cutworm	Agrotis ipsilon	Chewing Insects		
13004	13	004	Palau coconut beetle	Brontispa palauenis	Chewing Insects		
13005	13	005	clearwinged grasshopper	Camnula pellucida	Chewing Insects		
13006	13	006	cicadas	Cicadidae	Chewing Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
13007	13	007	eurytomids	Eurytoma spp.	Chewing Insects		
13008	13	008	cutworms	Euxoa excellens	Chewing Insects		
13009	13	009	whitefringed beetles	Graphognathus spp.	Chewing Insects		
13010	13	010	pales weevil	Hylobius pales	Chewing Insects		
13011	13	011	vegetable weevil	Listroderes difficilis	Chewing Insects		
13012	13	012	periodical cicada	Magicicada septendecim	Chewing Insects		
13013	13	013	migratory grasshopper	Melanoplus sanguinipes	Chewing Insects		
13014	13	014	valley grasshopper	Oedaleonotus enigma	Chewing Insects		
13015	13	015	strawberry root weevil	Otiorhyhchus ovatus	Chewing Insects		
13016	13	016	black vine weevil	Otiorhynchus sulcatus	Chewing Insects		
13017	13	017	pandanus beetle	Oxycephala pandani	Chewing Insects		
13018	13	018	spaeth pandanus	Oxycephala spaethi	Chewing Insects		
13019	13	019	agamemnon butterfly	Papilio agememnon	Chewing Insects		
13020	13	020	northern pitch twig moth	Petrova albicapitana	Chewing Insects		
13021	13	021	ponderosa pine tip moth	Rhyacionia zozana	Chewing Insects		
13022	13	022	pine needle weevil	Scythropus spp.	Chewing Insects		
13023	13	023	coconut longhorned grasshopper	Segestes unicolor	Chewing Insects		
13024	13	024	clover root curculio	Sitona hispidulus	Chewing Insects		
13025	13	025	Madron thrips	Thrips madronii	Chewing Insects		
13026	13	026	ash plant bug	Tropidosteptes amoenus	Chewing Insects		
13027	13	027	shorthorned grasshopper	Valanga nigricornis	Chewing Insects		
13028	13	028	pitch-eating weevil	Pachylobius picivorus	Chewing Insects		
13029	13	029	eastern pine weevil	Pissodes nemorensis	Chewing Insects		
13030	13	030	adana tip moth	Rhyacionia adana	Chewing Insects		
13800	13	800	other chewing insect (known)	other chewing insect (known)	Chewing Insects		
13900	13	900	unknown chewing insect	unknown chewing insect	Chewing Insects		
14000	**14**	**000**	**Sucking Insects**			Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
14001	14	001	scale insects		Sucking Insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
14002	14	002	western larch woolly aphid	Adelges oregonensis	Sucking Insects		
14003	14	003	balsam woolly adelgid	Adelges piceae	Sucking Insects	Any occurrence	**NRS;IW; PNW**
14004	14	004	hemlock woolly adelgid	Adelges tsugae	Sucking Insects	Any occurrence	**NRS; IW**
14005	14	005	spiraling whitefly	Aleurodicus dispersus	Sucking Insects		
14006	14	006	aphid	Aphididae	Sucking Insects		
14007	14	007	pine spittlebug	Aphrophora parallela	Sucking Insects		
14008	14	008	western pine spittlebug	Aphrophora permutata	Sucking Insects		
14009	14	009	Saratoga spittlebug	Aphrophora saratogensis	Sucking Insects		
14010	14	010	spittlebug	Cercopidae	Sucking Insects		
14011	14	011	wax scale	Ceroplastes spp.	Sucking Insects		
14012	14	012	pine needle scale	Chionaspis pinifoliae	Sucking Insects		
14014	14	014	giant conifer aphids	Cinara spp.	Sucking Insects		
14015	14	015	white pine aphid	Cinara strobi	Sucking Insects		
14016	14	016	beech scale	Cryptococcus fagisuga	Sucking Insects	Any occurrence	**NRS**
14017	14	017	spruce aphid	Elatobium abietinum	Sucking Insects		
14018	14	018	woolly apple aphid	Eriosoma lanigerum	Sucking Insects		
14019	14	019	striped mealybug	Ferrisia vergata	Sucking Insects		
14020	14	020	elongate hemlock scale	Fiorinia externa	Sucking Insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
14021	14	021	coconut red scale	Furcaspis oceanica	Sucking Insects		
14022	14	022	pine thrips	Gnophothrips spp.	Sucking Insects		
14023	14	023	leucaena psyllid	Heteropsylla cubana	Sucking Insects		
14024	14	024	honeysuckle aphids	Hyadaphis tataricae	Sucking Insects		
14025	14	025	Egyptian fluted scale	Icerya aegyptiaca	Sucking Insects		
14026	14	026	Lecanium scale	Lecanium spp.	Sucking Insects		
14027	14	027	common falsepit scale	Lecanodiaspis prosopidis	Sucking Insects		
14028	14	028	oystershell scale	Lepidosaphes ulmi	Sucking Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
14029	14	029	pinyon needle scale	Matsucoccus acalyptus	Sucking Insects		
14030	14	030	ponderosa pine twig scale	Matsucoccus bisetosus	Sucking Insects		
14031	14	031	pine twig scale	Matsucoccus californicus	Sucking Insects		
14032	14	032	ponderosa pine scale	Matsucoccus degeneratus	Sucking Insects		
14033	14	033	red pine scale	Matsucoccus resinosae	Sucking Insects	Any occurrence	**NRS**
14034	14	034	Prescott scale	Matsucoccus vexillorum	Sucking Insects		
14035	14	035	treehoopers	Membracidae	Sucking Insects		
14036	14	036	hibiscus psyllid	Mesohomotoma hibisci	Sucking Insects		
14037	14	037	balsam twig aphid	Mindarus abietinus	Sucking Insects		
14038	14	038	hibiscus mealybug	Nipaecoccus vastator	Sucking Insects		
14039	14	039	black pineleaf scale	Nuculaspis californica	Sucking Insects		
14040	14	040	spruce spider mite	Oligonychus ununquis	Sucking Insects		
14041	14	041	twig girdler	Oncideres cingulata	Sucking Insects		
14042	14	042	woolly alder aphid	Paraprociphilus tessellatus	Sucking Insects		
14043	14	043	maple aphids	Periphyllus spp.	Sucking Insects		
14044	14	044	spruce bud scale	Physokermes piceae	Sucking Insects		
14045	14	045	red pine adelgid	Pineus borneri	Sucking Insects		
14046	14	046	pine leaf adelgid	Pineus pinifoliae	Sucking Insects		
14047	14	047	white pine adelgid	Pineus spp.	Sucking Insects		
14048	14	048	pine bark adelgid	Pineus strobi	Sucking Insects		
14049	14	049	root aphid	Prociphilus americanus	Sucking Insects		
14050	14	050	mealybug	Pseudococcidae	Sucking Insects		
14051	14	051	cottony maple scale	Pulvinaria innumerabilis	Sucking Insects		
14052	14	052	fir mealybug	Puto cupressi	Sucking Insects		
14053	14	053	Douglas-fir mealybug	Puto profusus	Sucking Insects		
14054	14	054	spruce mealybug	Puto sandini	Sucking Insects		
14055	14	055	hemispherical scale	Saissetia coffeae	Sucking Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
14056	14	056	woolly pine needle aphid	Schizolachnus piniradiatae	Sucking Insects		
14057	14	057	steatococcus scale	Steatococcus samaraius	Sucking Insects		
14058	14	058	pear thrips	Taeniothrips inconsequens	Sucking Insects		
14059	14	059	mulberry whitefly	Tetraleurodes mori	Sucking Insects		
14060	14	060	tuliptree scale	Toumeyella liriodendri	Sucking Insects		
14061	14	061	pine tortoise scale	Toumeyella parvicornis	Sucking Insects		
14062	14	062	citrus snow scale	Unaspis citri	Sucking Insects		
14063	14	063	birch aphid	Euceraphis betulae	Sucking Insects		
14064	14	064	Kermes scale	Allokermes spp.	Sucking Insects		
14065	14	065	Casuarina spittlebug	Clastoptera undulata	Sucking Insects		
14066	14	066	giant bark aphid	Longistigma caryae	Sucking Insects		
14067	14	067	woolly pine scale	Pseudophilippia quaintancii	Sucking Insects		
14068	14	068	european elm scale	Gossyparia spuria	Sucking Insects		
14069	14	069	elm scurfy scale	Chionaspis americana	Sucking Insects		
14070	14	070	magnolia scale	Neolecanium cornuparvum	Sucking Insects		
14071	14	071	beech blight aphid	Grylloprociphilus imbricator	Sucking Insects		
14072	14	072	beech woolly aphid	Phyllaphis fagi	Sucking Insects		
14073	14	073	Asian cycad scale	Aulacaspis yasumatsui	Sucking Insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW**
14074	14	074	European fruit lecanium scale	Parthenolecanium corni	Sucking Insects		
14075	14	075	lobate lac scale	Paratachardina lobata	Sucking Insects		
14800	14	800	other sucking insect (known)	other sucking insect (known)	Sucking Insects		
14900	14	900	unknown sucking insect	unknown sucking insect	Sucking Insects		
15000	**15**	**000**	**Boring Insects**			Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	**ALL**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
15001	15	001	shoot borer		Boring Insects	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	**NRS**
15002	15	002	termite		Boring Insects		
15003	15	003	ponderosa pine bark borer	Acanthocinus princeps	Boring Insects		
15004	15	004	bronze birch borer	Agrilus anxius	Boring Insects	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	**NRS**
15005	15	005	twolined chestnut borers	Agrilus bilineatus	Boring Insects		
15006	15	006	bronze poplar borer	Agrilus liragus	Boring Insects		
15007	15	007	carpenter bees	Apidae	Boring Insects		
15008	15	008	flatheaded borer	Buprestidae	Boring Insects		
15009	15	009	golden buprestid	Buprestis aurulenta	Boring Insects		
15010	15	010	carpenter ants	Camponotus spp.	Boring Insects		
15011	15	011	gouty pitch midge	Cecidomyia piniinopis	Boring Insects		
15012	15	012	shootboring sawflies	Cephidae	Boring Insects		
15013	15	013	roundheaded borer	Cerambycidae	Boring Insects		
15014	15	014	flatheaded apple tree borer	Chrysobothris femorata	Boring Insects		
15015	15	015	cranberry girdler	Chrysoteuchia topiaria	Boring Insects		
15016	15	016	Columbian timber beetle	Corthylus columbianus	Boring Insects		
15017	15	017	pitted ambrosia beetle	Corthylus punctatissimus	Boring Insects		
15018	15	018	carpenterworm moths	Cossidae	Boring Insects		
15019	15	019	poplar and willow borer	Cryptorphynchus lapathi	Boring Insects		
15020	15	020	pine reproduction weevil	Cylindrocopturus eatoni	Boring Insects		
15021	15	021	Douglas-fir twig weevil	Cylindrocopturus furnissi	Boring Insects		
15022	15	022	Zimmerman pine moth	Dioryctria zimmermani	Boring Insects		
15023	15	023	oak twig borers	Elaphidionoides spp.	Boring Insects		
15024	15	024	twig pruner	Elaphidionoides villosus	Boring Insects		
15025	15	025	lesser cornstalk borer	Elasmopalpus lignosellus	Boring Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
15026	15	026	red oak borer	Enaphalodes rufulus	Boring Insects	Damage to ≥10% of the bole circumference.	**NRS**
15027	15	027	ponderous borer	Ergates spiculatus	Boring Insects		
15028	15	028	eastern pine shoot borer	Eucosma gloriola	Boring Insects		
15029	15	029	western pine shoot borer	Eucosma sonomana	Boring Insects		
15030	15	030	Eucosma shoot borers	Eucosma spp.	Boring Insects		
15031	15	031	sugar maple borer	Glycobius speciosus	Boring Insects	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	**NRS**
15032	15	032	Goes borers	Goes spp.	Boring Insects		
15033	15	033	pine root collar weevil	Hylobius radicis	Boring Insects		
15034	15	034	Warren root collar weevil	Hylobius warreni	Boring Insects		
15035	15	035	powderpost beetle	Lyctidae	Boring Insects		
15036	15	036	tarnished plant bug	Lygus lineolaris	Boring Insects		
15037	15	037	bark weevils	Magdalis spp.	Boring Insects		
15038	15	038	white pine barkminer moth	Marmara fasciella	Boring Insects		
15039	15	039	locust borer	Megacyllene robiniae	Boring Insects		
15040	15	040	California flathead borer	Melanophila californica	Boring Insects		
15041	15	041	flatheaded fir borer	Melanophila drummondi	Boring Insects		
15042	15	042	whitespotted sawyer	Monochamus scutellatus	Boring Insects		
15043	15	043	redheaded ash borer	Neoclytus acuminutus	Boring Insects		
15044	15	044	western ash borer	Neoclytus conjunctus	Boring Insects		
15045	15	045	oberea shoot borers	Oberea spp.	Boring Insects		
15046	15	046	eucalyptus longhorned borer	Phoracantha semipunctata	Boring Insects		
15047	15	047	northern pine weevil	Pissodes approximatus	Boring Insects		
15048	15	048	balsam bark weevil	Pissodes dubius	Boring Insects		
15049	15	049	Monterey pine weevil	Pissodes radiatae	Boring Insects		
15050	15	050	Engelmann spruce weevil	Pissodes strobi	Boring Insects		
15051	15	051	lodgepole terminal weevil	Pissodes terminalis	Boring Insects		
15052	15	052	ambrosia beetles	Platypus spp.	Boring Insects		
15053	15	053	cottonwood borer	Plectrodera scalator	Boring Insects		
15054	15	054	balsam shootboring sawfly	Pleroneura brunneicornis	Boring Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
15055	15	055	pine gall weevil	Podapion gallicola	Boring Insects		
15056	15	056	ash borer	Podesesia syringae fraxini	Boring Insects		
15057	15	057	lilac borer	Podosesia syringae	Boring Insects		
15058	15	058	carpenterworm	Prionoxystus robiniae	Boring Insects		
15059	15	059	maple shoot borers	Proterteras spp.	Boring Insects		
15060	15	060	western subterranean termite	Reticulitermes hesperus	Boring Insects		
15061	15	061	coconut trunk weevil	Rhabdoscelus asperipennis	Boring Insects		
15062	15	062	New Guinea sugarcane weevil	Rhabdoscelus obscurus	Boring Insects		
15063	15	063	European pine shoot moth	Rhyacionia buoliana	Boring Insects		
15064	15	064	western pine tip moth	Rhyacionia bushnelli	Boring Insects		
15065	15	065	Nantucket pine tip moth	Rhyacionia frustrana	Boring Insects		
15066	15	066	lodgepole pine tip moth	Rhyacionia montana	Boring Insects		
15067	15	067	southwestern pine tip moth	Rhyacionia neomexicana	Boring Insects		
15068	15	068	poplar borer	Saperda calcarata	Boring Insects		
15069	15	069	roundheaded appletree borer	Saperda candida	Boring Insects		
15070	15	070	Saperda shoot borer	Saperda spp.	Boring Insects		
15071	15	071	clearwing moths	Sesiidae	Boring Insects		
15072	15	072	dogwood borer	Synanthedon scitula	Boring Insects		
15073	15	073	roundheaded fir borer	Tetropium abietis	Boring Insects		
15074	15	074	western larch borer	Tetropium velutinum	Boring Insects		
15075	15	075	western cedar borer	Trachykele blondeli	Boring Insects		
15076	15	076	Douglas-fir pitch moth	Vespamima novaroensis	Boring Insects		
15077	15	077	sequoia pitch moth	Vespamima sequoia	Boring Insects		
15078	15	078	black twig borer	Xylosandrus compactus	Boring Insects		
15079	15	079	Pacific dampwood termite	Zootermopsis angusticollis	Boring Insects		
15080	15	080	subtropical pine tip moth	Rhyacionia subtropica	Boring Insects		
15081	15	081	Asian ambrosia beetle	Xylosandrus crassiusculus	Boring Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
15082	15	082	Asian longhorned beetle	Anoplophora glabripennis	Boring Insects		
15083	15	083	cottonwood twig borer	Gypsonoma haimbachiana	Boring Insects		
15084	15	084	southern pine sawyer	Monochamus titillator	Boring Insects		
15085	15	085	banded ash borer	Neoclytus capraea	Boring Insects		
15086	15	086	sitka spruce weevil	Pissodes sitchensis	Boring Insects		
15087	15	087	emerald ash borer	Agrilus planipennis	Boring Insects	Any occurrence	**NRS**
15088	15	088	hemlock borer	Melanophila fulvoguttata	Boring Insects	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	**NRS**
15089	15	089	Formosan subterranean termite	Coptotermes formosanus	Boring Insects		
15090	15	090	sirex woodwasp	Sirex noctilio	Boring Insects		
15091	15	091	Oregon fir sawyer	Monochamus scutellatus oregonensis	Boring Insects		
15092	15	092	cypress weevil	Eudociminus mannerheimii	Boring Insects		
15093	15	093	camphor shot borer	Xylosandrus mutilatus	Boring Insects		
15094	15	094	goldenspotted oak borer	Agrilus coxalis	Boring Insects		
15095	15	095	European oak borer	Agrilus sulcicollis	Boring Insects		
15096	15	096	X. germanus ambrosia beetle	Xylosandrus germanus	Boring Insects		
15097	15	097	*Icosium tomentosum*	Icosium tomentosum	Boring Insects		
15800	15	800	other boring insect (known)	other boring insect (known)	Boring Insects		
15900	15	900	unknown boring insect	unknown boring insect	Boring Insects		
16000	**16**	**000**	**Seed/Cone/Flower/Fruit Insects**				
16001	16	001	Douglas-fir cone moth	Barbara colfaxiana	Seed/Cone/Flower/Fruit Insects		
16002	16	002	lodgepole cone beetle	Conophthorus contortae	Seed/Cone/Flower/Fruit Insects		
16003	16	003	limber pine cone beetle	Conophthorus flexilis	Seed/Cone/Flower/Fruit Insects		
16004	16	004	mountain pine cone beetle	Conophthorus monticolae	Seed/Cone/Flower/Fruit Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
16005	16	005	ponderosa pine cone beetle	Conophthorus ponderosae	Seed/Cone/Flower/Fruit Insects		
16006	16	006	Monterey pine cone beetle	Conophthorus radiatae	Seed/Cone/Flower/Fruit Insects		
16007	16	007	red pine cone beetle	Conophthorus resinosae	Seed/Cone/Flower/Fruit Insects		
16008	16	008	white pine cone beetle	Conopthorus coniperda	Seed/Cone/Flower/Fruit Insects		
16009	16	009	black walnut curculio	Conotrachelus retentus	Seed/Cone/Flower/Fruit Insects		
16010	16	010	Douglas-fir cone gall midge	Contarinia oregonensis	Seed/Cone/Flower/Fruit Insects		
16011	16	011	Douglas-fir cone scale midge	Contarinia washingtonensis	Seed/Cone/Flower/Fruit Insects		
16012	16	012	acorn/nut weevils	Curculio spp.	Seed/Cone/Flower/Fruit Insects		
16013	16	013	Caroline fruitfly	Dacus frauenfeldi	Seed/Cone/Flower/Fruit Insects		
16014	16	014	spruce bud midge	Dasineura swainei	Seed/Cone/Flower/Fruit Insects		
16015	16	015	fir coneworm	Dioryctria abietivorella	Seed/Cone/Flower/Fruit Insects		
16016	16	016	southern pine cone worm	Dioryctria amatella	Seed/Cone/Flower/Fruit Insects		
16017	16	017	ponderosa pine coneworm	Dioryctria auranticella	Seed/Cone/Flower/Fruit Insects		
16018	16	018	loblolly pine cone worm	Dioryctria merkeli	Seed/Cone/Flower/Fruit Insects		
16019	16	019	ponderosa twig moth	Dioryctria ponderosae	Seed/Cone/Flower/Fruit Insects		
16020	16	020	Dioryctria pseudotsugella	Dioryctria pseudotsugella	Seed/Cone/Flower/Fruit Insects		
16021	16	021	Dioryctria moths	Dioryctria spp.	Seed/Cone/Flower/Fruit Insects		
16022	16	022	lodgepole cone moth	Eucosma rescissoriana	Seed/Cone/Flower/Fruit Insects		
16023	16	023	seed chalcid	Eurytomidae	Seed/Cone/Flower/Fruit Insects		
16024	16	024	slash pine flower thrips	Gnophothrips fuscus	Seed/Cone/Flower/Fruit Insects		
16025	16	025	spruce cone maggot	Hylemya anthracina	Seed/Cone/Flower/Fruit Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
16026	16	026	longleaf pine seed worm or moth	Laspeyresia ingens	Seed/Cone/Flower/Fruit Insects		
16027	16	027	ponderosa pine seed moth	Laspeyresia piperana	Seed/Cone/Flower/Fruit Insects		
16028	16	028	spruce seed moth	Laspeyresia youngana	Seed/Cone/Flower/Fruit Insects		
16029	16	029	boxelder bug	Leptocoris trivittatus	Seed/Cone/Flower/Fruit Insects		
16030	16	030	leaffooted pine seed bug	Leptoglossus corculus	Seed/Cone/Flower/Fruit Insects		
16031	16	031	western conifer seed bug	Leptoglossus occidentalis	Seed/Cone/Flower/Fruit Insects		
16032	16	032	hollyhock thrips	Liothrips varicornis	Seed/Cone/Flower/Fruit Insects		
16033	16	033	Magastigmus lasiocarpae	Magastigmus lasiocarpae	Seed/Cone/Flower/Fruit Insects		
16034	16	034	spruce seed chalcid	Magastigmus piceae	Seed/Cone/Flower/Fruit Insects		
16035	16	035	ponderosa pine seed chalcid	Megastigmus albifrons	Seed/Cone/Flower/Fruit Insects		
16036	16	036	fir seed chalcid	Megastigmus pinus	Seed/Cone/Flower/Fruit Insects		
16037	16	037	Douglas-fir seed chalcid	Megastigmus spermotrophs	Seed/Cone/Flower/Fruit Insects		
16038	16	038	yellow poplar weevil	Odontopus calceatus	Seed/Cone/Flower/Fruit Insects		
16039	16	039	fruitpiercing moth	Othreis fullonia	Seed/Cone/Flower/Fruit Insects		
16040	16	040	roundheaded cone borer	Paratimia conicola	Seed/Cone/Flower/Fruit Insects		
16041	16	041	mango shoot caterpillar	Penicillaria jocosatrix	Seed/Cone/Flower/Fruit Insects		
16042	16	042	coneworm	Phycitidae	Seed/Cone/Flower/Fruit Insects		
16043	16	043	harvester ants	Pogonomyrmex spp.	Seed/Cone/Flower/Fruit Insects		
16044	16	044	citrus flower moth	Prays citri	Seed/Cone/Flower/Fruit Insects		
16045	16	045	fir cone maggot	Strobilomyia abietis	Seed/Cone/Flower/Fruit Insects		
16046	16	046	spruce cone maggot	Strobilomyia anthracina	Seed/Cone/Flower/Fruit Insects		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
16047	16	047	shieldbacked pine seed bug	Tetyra bipunctata	Seed/Cone/Flower/Fruit Insects		
16048	16	048	coneworm	Hylemia spp.	Seed/Cone/Flower/Fruit Insects		
16049	16	049	prairie tent caterpillar	Malacosoma lutescens	Seed/Cone/Flower/Fruit Insects		
16050	16	050	jack pine tip beetle	Conophthorus banksianae	Seed/Cone/Flower/Fruit Insects		
16051	16	051	webbing coneworm	Dioryctria disclusa	Seed/Cone/Flower/Fruit Insects		
16052	16	052	blister coneworm	Dioryctria clarioralis	Seed/Cone/Flower/Fruit Insects		
16053	16	053	southern cone gall midge	Cecidomyia bisetosa	Seed/Cone/Flower/Fruit Insects		
16054	16	054	seed bugs	Lygaeidae spp.	Seed/Cone/Flower/Fruit Insects		
16800	16	800	other seed/cone/flower insect (known)	other seed/cone/flower insect (known)	Seed/Cone/Flower/Fruit Insects		
16900	16	900	unknown seed/cone/ flower insects	unknown seed/cone/ flower insects	Seed/Cone/Flower/Fruit Insects		
17000	**17**	**000**	**Gallmaker Insects**				
17001	17	001	birch budgall mite	Aceria rudis	Gallmaker Insects		
17002	17	002	eastern spruce gall adelgid	Adelges abietis	Gallmaker Insects		
17003	17	003	Cooley spruce gall adelgid	Adelges cooleyi	Gallmaker Insects		
17004	17	004	horned oak gall	Callirhytis cornigera	Gallmaker Insects		
17005	17	005	oak gall wasp	Callirhytis quercuspunctata	Gallmaker Insects		
17006	17	006	gall midge	Cecidomyiidae	Gallmaker Insects		
17007	17	007	Douglas-fir needle gall midge	Contarinia pseudotsugae	Gallmaker Insects		
17008	17	008	gall mite	Eriophyidae	Gallmaker Insects		
17009	17	009	spruce gall midge	Mayetiola piceae	Gallmaker Insects		
17010	17	010	hackberry nipplegall maker	Pachypsylla celtidismamma	Gallmaker Insects		
17011	17	011	balsam gall midge	Paradiplosis tumifex	Gallmaker Insects	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
17012	17	012	hickory gall Phylloxera	Phylloxera caryaecaulis	Gallmaker Insects		
17013	17	013	gall aphid	Phylloxeridae	Gallmaker Insects		
17014	17	014	alder gall mite	Phytoptus laevis	Gallmaker Insects		
17015	17	015	psyllid	Psyllidae	Gallmaker Insects		
17016	17	016	sugarberry psyllid	Tetragonocephela flava	Gallmaker Insects		
17017	17	017	mountain apple psyllid	Trioza vitiensis	Gallmaker Insects		
17018	17	018	gouty pitch midge	Cedidomyia piniinopsis	Gallmaker Insects		
17019	17	019	spider mites	Oligonychus spp.	Gallmaker Insects		
17020	17	020	cypress gall midges	Taxodiomyia spp.	Gallmaker Insects		
17021	17	021	jumping oak gall wasp	Neuroterus saltatorius	Gallmaker Insects		
17022	17	022	erythrina gall wasp	Quadrastichus erythrinae	Gallmaker Insects		
17800	17	800	other gallmaking insect (known)	other gallmaking insect (known)	Gallmaker Insects		
17900	17	900	unknown gallmaking insect	unknown gallmaking insect	Gallmaker Insects		
18000	**18**	**000**	**Insect Predators**				
18001	18	001	lacewing		Insect Predators		
18002	18	002	blackbellied clerid	Enoclerus lecontei	Insect Predators		
18003	18	003	redbellied clerid	Enoclerus sphegeus	Insect Predators		
18004	18	004	red wood ant	Formica rufa	Insect Predators		
18005	18	005	western yellowjacket	Vespula pennsylvanica	Insect Predators		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
19000	**19**	**000**	**General Diseases**			Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
20000	**20**	**000**	**Biotic Damage**				
20001	20	001	damping off		Biotic Damage		
20002	20	002	gray mold	Botrytis cinerea	Biotic Damage		
20003	20	003	Cassytha	Cassytha filiformis	Biotic Damage		
20004	20	004	hemlock fluting		Biotic Damage		
21000	**21**	**000**	**Root/Butt Diseases**			Any occurrence	**ALL**
21001	21	001	Armillaria root disease	Armillaria spp.	Root/Butt Diseases	Any occurrence	**PNW; NRS**
21002	21	002	yellow stringy rot	Corticium galactimum	Root/Butt Diseases		
21003	21	003	Cylindrocladium root disease	Cylindrocladium spp.	Root/Butt Diseases		
21004	21	004	brown crumbly rot	Fomitopsis pinicola	Root/Butt Diseases		
21005	21	005	black root rot of pine	Fusarium oxysporum	Root/Butt Diseases		
21006	21	006	Fusarium root rot	Fusarium spp.	Root/Butt Diseases		
21007	21	007	white mottled rot	Ganoderma applanatum	Root/Butt Diseases	Any visual evidence	**PNW-AK**
21008	21	008	Ganoderma rot of hardwoods	Ganoderma lucidum	Root/Butt Diseases	Any occurrence	**PNW**
21009	21	009	Ganoderma rot of conifers	Ganoderma tsugae	Root/Butt Diseases	Any visual evidence	**PNW-AK**
21010	21	010	Heterobasidion root disease	Heterobasidion annosum	Root/Butt Diseases	Any occurrence	**PNW; NRS**
21011	21	011	circinatus root rot	Inonotus circinatus	Root/Butt Diseases		
21012	21	012	tomentosus root rot/false velvet top fungus	Inonotus tomentosus	Root/Butt Diseases		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
21013	21	013	charcoal root rot	Macrophomina phaseolina	Root/Butt Diseases		
21014	21	014	black stain root disease	Ophiostoma wageneri	Root/Butt Diseases	Any occurrence	**PNW**
21015	21	015	Schweinitzii root and butt rot	Phaeolus schweinitzii	Root/Butt Diseases	Any occurrence	**PNW**
21016	21	016	flame tree root disease	Phellinus noxious	Root/Butt Diseases	Any occurrence	**PNW**
21017	21	017	laminated root rot	Phellinus weirii	Root/Butt Diseases	Any occurrence	**PNW**
21019	21	019	littleleaf disease/ Phytophthora root rot	Phytophthora cinnamomi	Root/Butt Diseases		
21020	21	020	Port-Orford-Cedar root disease	Phytophthora lateralis	Root/Butt Diseases	Any occurrence	**PNW**
21022	21	022	Pythium root rot	Pythium spp.	Root/Butt Diseases		
21023	21	023	procera root disease of conifers	Verticicladiella procera	Root/Butt Diseases		
21024	21	024	crown gall	Agrobacterium tumefaciens	Root/Butt Diseases		
21025	21	025	borealis conk	Climacocystis borealis	Root/Butt Diseases		
21026	21	026	yellow pitted rot	Hericium abietis	Root/Butt Diseases		
21027	21	027	brown cubical rot	Laetiporus sulphureus	Root/Butt Diseases	Any occurrence	**PNW**
21028	21	028	sudden oak death	Phytophthora ramorum	Root/Butt Diseases	Any occurrence	**PNW**
21029	21	029	Rhizina root disease	Rhizina undulata	Root/Butt Diseases		
21030	21	030	yellow root rot	Perenniporia subacida	Root/Butt Diseases		
21031	21	031	brown top rot	Fomitopsis cajanderi	Root/Butt Diseases		
21033	21	033	pocket dry rot	Tyromyces amarus	Root/Butt Diseases		
21700	21	700	root or butt decay (indicators present)	root or butt decay (indicators present)	Root/Butt Diseases		
21800	21	800	other root or butt disease (known)	other root or butt disease (known)	Root/Butt Diseases		
21900	21	900	unknown root or butt disease	unknown root or butt disease	Root/Butt Diseases		
22000	**22**	**000**	**Cankers**			Any occurrence	**All**
22005	22	005	viruses		Cankers		
22006	22	006	black knot of cherry	Apiosporina morbosa	Cankers	Any occurrence on the bole or on branches ≤1 foot from bole; damage to ≥50% of branches	**NRS**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
22007	22	007	Atropellis canker	Atropellis piniphila	Cankers		
22008	22	008	Siberian elm canker	Botryodiplodia hypodermia	Cankers		
22009	22	009	Botryosphaeria canker	Botryosphaeria ribis	Cankers		
22011	22	011	Caliciopsis canker	Caliciopsis pinea	Cankers	Any occurrence	**NRS**
22012	22	012	black canker of aspen	Ceratocystis fimbriata	Cankers		
22013	22	013	sycamore canker stain	Ceratocystis fimbriata f.sp. plataini	Cankers		
22023	22	023	chestnut blight	Cryphonectria parasitica	Cankers	Any occurrence	**NRS**
22025	22	025	Cryptosphaeria canker of aspen	Cryptosphaeria populina	Cankers		
22026	22	026	Cytospora canker of fir	Cytospora abietis	Cankers		
22029	22	029	sooty-bark canker	Encoelia pruinosa	Cankers		
22030	22	030	Eutypella canker	Eutypella parasitica	Cankers	Any occurrence	**NRS**
22032	22	032	pitch canker of pines	Fusarium subglutinans	Cankers	Any occurrence	**PNW**
22033	22	033	Fusicoccum canker	Fusicoccum spp.	Cankers		
22034	22	034	Scleroderris canker	Gremmeniella abietina	Cankers		
22035	22	035	amelanchier rust	Gymnosporangium harknessianum	Cankers		
22036	22	036	cedar apple rust	Gymnosporangium juniperi-virginianae	Cankers		
22037	22	037	Hypoxylon canker of oak	Hypoxylon atropunctatum	Cankers		
22038	22	038	Hypoxylon canker of aspen	Hypoxylon mammatum	Cankers	Any occurrence	**NRS**
22041	22	041	European larch canker	Lachnellula willkommii	Cankers		
22042	22	042	beech bark disease	Nectria coccinea	Cankers	Any occurrence	**NRS**
22043	22	043	Nectria canker	Nectria galligena	Cankers	Any occurrence	**NRS**
22050	22	050	Phomopsis canker	Phomopsis occulta	Cankers		
22051	22	051	Phomopsis canker	Phomopsis spp.	Cankers		
22052	22	052	cypress canker	Seiridium cardinale	Cankers		
22053	22	053	butternut canker	Sirococcus clavigignenti-jugl.	Cankers	Any occurrence	**NRS**
22054	22	054	maple canker	Steganosporium spp.	Cankers		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
22055	22	055	Thyronectria canker	Thyronectria austro-americana	Cankers		
22056	22	056	citrus canker	Xanthomonas citri	Cankers		
22057	22	057	Cytospora canker of aspen	Cytospora chrysosperma	Cankers		
22058	22	058	Dothichiza canker	Dothichiza populae	Cankers		
22060	22	060	Leucocytospora canker of spruce	Leucocytospora kunzei	Cankers		
22073	22	073	hemlock canker	Xenomeris abietis	Cankers		
22075	22	075	Lachnellula canker	Lachnellula flavovirens	Cankers	Any occurrence	**NRS**
22076	22	076	strumella canker	Strumella coryneoidea	Cankers	Any occurrence	**NRS**
22077	22	077	phomopsis blight	Phomopsis juniperovora	Cankers		
22078	22	078	fusarium canker of yellow poplar	Fusarium solani	Cankers		
22079	22	079	sterile conk of maple and beech	Inonotus glomeratus	Cankers		
22080	22	080	canker of spruce	Aleurodiscus spp.	Cankers		
22082	22	082	Discocainia canker	Discocainia treleasei	Cankers		
22083	22	083	red ring rot canker	Phellinus pini var. cancriformans	Cankers		
22084	22	084	Douglas-fir cankers	Douglas-fir cankers	Cankers		
22085	22	085	Scleroderris canker of western firs	Grovesiella abieticola	Cankers		
22086	22	086	Thousand cankers disease	Geosmithia morbida	Cankers		
22087	22	087	nonrust canker	unknown	Cankers	Damage ≥20% of bole circumference (in a running 3-foot section) at point of occurrence	**PNW**
22300	22	300	other canker disease (known)	other canker disease (known)	Cankers		
22400	22	400	unknown canker disease	unknown canker disease	Cankers		
22500	**22**	**500**	**Stem Decay**		Stem Decays	Any visual evidence (conks; fruiting bodies; rotten wood)	**All**
22001	22	001	heart rot		Stem Decays	Any visual evidence	**SRS**
22002	22	002	stem rot		Stem Decays		
22003	22	003	sap rot		Stem Decays		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
22004	22	004	slime flux		Stem Decays		
22010	22	010	black rot fungus	Botryosphaeria stevensii	Stem Decays		
22024	22	024	gray-brown sap rot	Cryptoporus volvatus	Stem Decays		
22027	22	027	western red rot	Dichomitus squalens	Stem Decays		
22028	22	028	Indian paint fungus	Echinodontium tinctorium	Stem Decays	Any occurrence	**PNW**
22031	22	031	Fusarium cortical stem rot	Fusarium avenaceum	Stem Decays		
22039	22	039	canker rot of oak	Inonotus hispidus	Stem Decays		
22040	22	040	sterile conk trunk rot of birch, chaga	Inonotus obliquus	Stem Decays	Any visual evidence	**PNW-AK**
22044	22	044	ash heart rot	Pereniporia fraxinophila	Stem Decays		
22047	22	047	red heart rot	Phellinus pini	Stem Decays	Any occurrence	**PNW**
22048	22	048	aspen trunk rot	Phellinus tremulae	Stem Decays	Any visual evidence	**PNW-AK**
22049	22	049	stem decay of black walnut	Phellinus weirianus	Stem Decays		
22059	22	059	red belt fungus/brown crumbly rot	Fomitopsis pinicola	Stem Decays	Any visual evidence	**PNW-AK**
22062	22	062	quinine fungus/brown trunk rot	Fomitopsis Officinalis	Stem Decays	Any visual evidence	**PNW-AK**
22063	22	063	brown cubical decay	Coniophora puteana	Stem Decays		
22064	22	064	tinder fungus	Fomes fomentarius	Stem Decays	Any visual evidence	**PNW-AK**
22065	22	065	purple conk	Hirschioporus abietinus	Stem Decays		
22066	22	066	pinyon black stain	Leptographium wagnerii	Stem Decays		
22067	22	067	*Phellinus hartigii*	Phellinus hartigii	Stem Decays	Any visual evidence	**PNW-AK**
22068	22	068	false tinder fungus	Phellinus igniarius	Stem Decays	Any visual evidence	**PNW-AK**
22069	22	069	robustus conk	Phellinus robustus	Stem Decays		
22070	22	070	yellow cap fungus	Pholiota spp.	Stem Decays	Any visual evidence	**PNW-AK**
22071	22	071	oyster mushroom	Pleurotus ostreatus	Stem Decays		
22072	22	072	white ring rot	Poria albipellucida	Stem Decays		
22074	22	074	cedar brown pocket rot	Poria sericeomollis	Stem Decays		
22081	22	081	birch conk	Piptoporus betulinus	Stem Decays	Any visual evidence	**PNW-AK**
22800	22	800	other stem decay (known)	other stem decay (known)	Stem Decays		
22900	22	900	unknown stem decay	unknown stem decay	Stem Decays		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
23000	**23**	**000**	**Parasitic/Epiphytic Plants**			Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes or vines covering ≥50% of crown	**ALL**
23001	23	001	mistletoe	mistletoe	Parasitic/Epiphytic Plants		
23002	23	002	parasitic plants	parasitic plants	Parasitic/Epiphytic Plants		
23003	23	003	vine damage	vine damage	Parasitic/Epiphytic Plants	Vines covering ≥50% of crown	**PNW; NRS**
23005	23	005	white fir dwarf mistletoe	Arceuthobium abietinum f. sp. concoloris	Parasitic/Epiphytic Plants		
23006	23	006	lodgepole pine dwarf mistletoe	Arceuthobium americanum	Parasitic/Epiphytic Plants		
23007	23	007	Apache dwarf mistletoe	Arceuthobium apachecum	Parasitic/Epiphytic Plants		
23008	23	008	western dwarf mistletoe	Arceuthobium campylopodum	Parasitic/Epiphytic Plants		
23009	23	009	limber pine dwarf mistletoe	Arceuthobium cyanocarpum	Parasitic/Epiphytic Plants		
23010	23	010	pinyon dwarf mistletoe	Arceuthobium divaricatum	Parasitic/Epiphytic Plants		
23011	23	011	Douglas-fir dwarf mistletoe	Arceuthobium douglasii	Parasitic/Epiphytic Plants		
23012	23	012	Chihuahua pine dwarf mistletoe	Arceuthobium gillii	Parasitic/Epiphytic Plants		
23013	23	013	larch dwarf mistletoe	Arceuthobium laricis	Parasitic/Epiphytic Plants		
23014	23	014	western spruce dwarf mistletoe	Arceuthobium microcarpum	Parasitic/Epiphytic Plants		
23015	23	015	eastern dwarf mistletoe	Arceuthobium pusillum	Parasitic/Epiphytic Plants	Any occurrence	**NRS**
23016	23	016	hemlock dwarf mistletoe	Arceuthobium tsugense	Parasitic/Epiphytic Plants	Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes or vines covering ≥50% of crown	**PNW-AK**
23017	23	017	southwestern dwarf mistletoe	Arceuthobium vaginatum subsp. crytopodum	Parasitic/Epiphytic Plants		
23018	23	018	dodder	Cuscuta spp.	Parasitic/Epiphytic Plants		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
23019	23	019	white fir mistletoe	Phoradendron bolleanum subsp. pauciflorum	Parasitic/Epiphytic Plants		
23020	23	020	true mistletoe (other)		Parasitic/Epiphytic Plants	True mistletoe covering ≥50% of crown	**IW; PNW**
23021	23	021	red fir dwarf mistletoe	Arceuthobium abietinum f. sp. magnificae	Parasitic/Epiphytic Plants		
23022	23	022	juniper true mistletoe	Phoradendron juniperum	Parasitic/Epiphytic Plants		
23023	23	023	dwarf mistletoe	Arceuthobium spp.	Parasitic/Epiphytic Plants	Hawksworth rating of ≥3	**IW; PNW**
23024	23	024	Weins dwarf mistletoe	Arceuthobium abietinum f. sp magnificae	Parasitic/Epiphytic Plants		
24000	**24**	**000**	**Decline Complexes/Dieback/Wilts**			Damage ≥20% dieback of crown area	**ALL**
24001	24	001	Alaska-yellow cedar decline	Alaska-yellow cedar decline	Decline Complexes/Dieback/Wilts		
24002	24	002	Norfolk Island pine decline	Norfolk Island pine decline	Decline Complexes/Dieback/Wilts		
24003	24	003	Stillwell's syndrome	Stillwell's syndrome	Decline Complexes/Dieback/Wilts		
24004	24	004	ash decline/yellows	ash decline/yellows	Decline Complexes/Dieback/Wilts	Damage ≥20% dieback of crown area	**NRS**
24005	24	005	birch dieback	birch dieback	Decline Complexes/Dieback/Wilts		
24006	24	006	coconut cadang-cadang viroid	Cocadviroid coconut cadang-cadang viroid	Decline Complexes/Dieback/Wilts	Damage ≥20% dieback of crown area	**PNW**
24007	24	007	complex	complex	Decline Complexes/Dieback/Wilts		
24008	24	008	decline	decline	Decline Complexes/Dieback/Wilts		
24009	24	009	fall hardwood defoliator complex	fall hardwood defoliator complex	Decline Complexes/Dieback/Wilts		
24010	24	010	joga decline	joga decline	Decline Complexes/Dieback/Wilts	Damage ≥20% dieback of crown area	**PNW**
24011	24	011	larch decline	larch decline	Decline Complexes/Dieback/Wilts		
24012	24	012	looper abiotic complex	looper abiotic complex	Decline Complexes/Dieback/Wilts		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
24013	24	013	maple decline	maple decline	Decline Complexes/Dieback/Wilts		
24014	24	014	oak decline	Hypoxylon spp.	Decline Complexes/Dieback/Wilts		
24015	24	015	pingelap disease	pingelap disease	Decline Complexes/Dieback/Wilts		
24016	24	016	sprout dieback	sprout dieback	Decline Complexes/Dieback/Wilts		
24017	24	017	true fir pest complex	true fir pest complex	Decline Complexes/Dieback/Wilts		
24018	24	018	western X disease	western X disease	Decline Complexes/Dieback/Wilts		
24019	24	019	pinewood nematode	Bursaphelenchus xylophilus	Decline Complexes/Dieback/Wilts		
24020	24	020	sapstreak disease of sugar maple	Ceratocystis coerulescens	Decline Complexes/Dieback/Wilts		
24021	24	021	oak wilt	Ceratocystis fagacearum	Decline Complexes/Dieback/Wilts	Damage ≥20% dieback of crown area	**NRS**
24022	24	022	Dutch elm disease	Ceratocystis ulmi	Decline Complexes/Dieback/Wilts	Damage ≥20% dieback of crown area	**NRS**
24023	24	023	bacterial wetwood	Erwinia nimipressuralis	Decline Complexes/Dieback/Wilts		
24024	24	024	mimosa wilt	Fusarium oxysporum f. sp. perniciosum	Decline Complexes/Dieback/Wilts		
24025	24	025	Verticillium wilt	Verticilium albo-atrum	Decline Complexes/Dieback/Wilts		
24026	24	026	bacterial leaf scorch	Xylella fastidiosa	Decline Complexes/Dieback/Wilts		
24027	24	027	wetwood	wetwood	Decline Complexes/Dieback/Wilts		
24028	24	028	hemlock decline	hemlock decline	Decline Complexes/Dieback/Wilts		
24029	24	029	Pacific madrone decline	Pacific madrone decline	Decline Complexes/Dieback/Wilts		
24030	24	030	elm phloem necrosis	Mycoplasma spp.	Decline Complexes/Dieback/Wilts		
24031	24	031	laurel wilt	Raffaelea spp.	Decline Complexes/Dieback/Wilts		
24032	24	032	sudden aspen decline	sudden aspen decline	Decline Complexes/Dieback/Wilts		
24800	24	800	other decline/complex/wilt (known)	other decline/complex/ wilt (known)	Decline Complexes/Dieback/Wilts		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
24900	24	900	unknown decline/complex/ wilt	unknown decline/complex/ wilt	Decline Complexes/Dieback/Wilts		
25000	**25**	**000**	**Foliage diseases**			Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
25001	25	001	blight	blight	Foliage diseases		
25003	25	003	juniper blights	juniper blights	Foliage diseases		
25004	25	004	leaf spots	leaf spots	Foliage diseases		
25005	25	005	needlecast	needlecast	Foliage diseases		
25006	25	006	powdery mildew	powdery mildew	Foliage diseases		
25007	25	007	tobacco mosaic virus	tobacco mosaic virus	Foliage diseases		
25008	25	008	tobacco ringspot virus of ash	Nepovirus TRSV	Foliage diseases		
25009	25	009	true fir needlecast	true fir needlecast	Foliage diseases		
25010	25	010	sycamore anthracnose	Apiognomonia veneta	Foliage diseases		
25011	25	011	Cercospora blight of juniper	Cercospora sequoiae	Foliage diseases		
25013	25	013	large-spored spruce-laborador tea rust	Chrysomyxa ledicola	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW-AK**
25014	25	014	ink spot of aspen	Ciborinia whetzelii	Foliage diseases		
25015	25	015	pine needle rust	Coleosporium spp.	Foliage diseases		
25016	25	016	anthracnose on Russian olive	Colletotrichum spp.	Foliage diseases		
25017	25	017	Coronado limb rust	Cronartium arizonicum	Foliage diseases		
25018	25	018	leaf shothole	Cylindrosporium spp.	Foliage diseases		
25019	25	019	cedar leaf blight	Didymascella thujina	Foliage diseases		
25020	25	020	dogwood anthracnose	Discula spp.	Foliage diseases		
25021	25	021	mango scab	Elsinoe magiferae	Foliage diseases		
25022	25	022	Elytroderma needle blight	Elytroderma deformans	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW**
25023	25	023	fire blight	Erwinia amylovora	Foliage diseases		
25024	25	024	walnut anthracnose	Gnomonia leptostyla	Foliage diseases		
25025	25	025	anthracnose	Gnomonia spp.	Foliage diseases		
25027	25	027	brown felt blight	Herpotrichia juniperi	Foliage diseases		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
25028	25	028	larch needle blight	Hypodermella laricis	Foliage diseases		
25029	25	029	hardwood anthracnose	Kabatiella apocrypta	Foliage diseases		
25030	25	030	Lasiodiplodia cone damage	Lasiodiplodia spp.	Foliage diseases		
25031	25	031	spruce needle cast	Lirula macrospora	Foliage diseases		
25032	25	032	fir needle cast	Lirula spp.	Foliage diseases		
25033	25	033	white pine needle cast	Lophodermella arcuata	Foliage diseases		
25034	25	034	Lophodermella needle cast	Lophodermella spp.	Foliage diseases		
25036	25	036	Marssonina blight	Marssonina populi	Foliage diseases		
25037	25	037	Douglas-fir rust	Melampsora medusae	Foliage diseases		
25039	25	039	larch needle cast	Meria laricis	Foliage diseases		
25040	25	040	Dothistroma needle blight	Mycosphaerella pini	Foliage diseases		
25041	25	041	brown felt blight of pines	Neopeckia coulteri	Foliage diseases		
25042	25	042	snow blight	Phacidum abietis	Foliage diseases		
25043	25	043	Swiss needle cast	Phaeocryptopus gaumannii	Foliage diseases		
25044	25	044	Phoma blight	Phoma spp.	Foliage diseases		
25045	25	045	Phyllosticta leaf spot	Phyllosticta spp.	Foliage diseases		
25046	25	046	bud rot	Phytophthora palmivora	Foliage diseases		
25047	25	047	Ploioderma needle cast	Ploioderma spp.	Foliage diseases		
25048	25	048	ash rust	Puccinia sparganioides	Foliage diseases		
25049	25	049	fir and hemlock needle rusts	Pucciniastrum spp.	Foliage diseases		
25050	25	050	Rhabdocline needle cast	Rhabdocline spp.	Foliage diseases		
25051	25	051	Rhizoctonia needle blight	Rhizoctonia spp.	Foliage diseases		
25052	25	052	Rhizophaeria needle cast	Rhizophaeria spp.	Foliage diseases		
25053	25	053	Rhizopus rot	Rhizopus artocarpi	Foliage diseases		
25054	25	054	brown spot needle blight	Scirrhia acicola	Foliage diseases		
25055	25	055	Septoria leaf spot	Septoria alnifolia	Foliage diseases		
25056	25	056	Septoria leaf spot and canker	Septoria musiva	Foliage diseases		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
25057	25	057	Sirococcus tip blight	Sirococcus conigenus	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
25058	25	058	Diplodia canker	Sphaeropsis sapinea	Foliage diseases		
25059	25	059	leaf blister of oak	Taphrina caerulescens	Foliage diseases		
25060	25	060	Venturia leaf blight of maple	Venturia acerina	Foliage diseases		
25061	25	061	shepherd's crook	Venturia tremulae	Foliage diseases		
25062	25	062	Dothistroma needle blight	Dothistroma septospora	Foliage diseases		
25063	25	063	yellow-cedar shoot blight	Apostrasseria spp.	Foliage diseases		
25065	25	065	spruce needle rust	Chrysomyxa weirii	Foliage diseases		
25066	25	066	cedar leaf blight	Gymnosporangium nootkatense	Foliage diseases		
25067	25	067	spruce needle cast	Lophodermium picea	Foliage diseases		
25068	25	068	hardwood leaf rusts	Melampsora spp.	Foliage diseases		
25070	25	070	hemlock needle rust	Pucciniastrum vaccinii	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW-AK**
25071	25	071	spruce needle cast	Rhizosphaera pini	Foliage diseases		
25072	25	072	sirococcus shoot blight	Sirococcus strobilinus	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
25073	25	073	shepherds crook	Venturia populina	Foliage diseases		
25074	25	074	Delphinella shoot blight	Delphinella abietis	Foliage diseases		
25075	25	075	tar spot	Rhytisma acerinum	Foliage diseases		
25076	25	076	birch leaf fungus	Septoria betulae	Foliage diseases		
25077	25	077	Septoria leaf spot of maple	Septoria aceris	Foliage diseases		
25800	25	800	other /shoot disease (known)	other /shoot disease (known)	Foliage diseases		
25900	25	900	unknown foliage /shoot disease	Unknown foliage /shoot disease	Foliage diseases		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
26000	**26**	**000**	**Stem Rusts**			Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	**ALL**
26001	26	001	white pine blister rust	Cronartium ribicola	Stem Rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	**PNW; SRS**
26002	26	002	western gall rust	Peridermium harknessii	Stem Rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	**PNW**
26003	26	003	stalactiform blister rust	Cronartium coleosporioides	Stem Rusts		
26004	26	004	comandra blister rust	Cronartium comandrae	Stem Rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	**SRS**
26005	26	005	pinyon rust	Cronartium occidentale	Stem Rusts		
26006	26	006	eastern gall rust	Cronartium quercuum	Stem Rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	**SRS**
26007	26	007	gall rust of jack pine	Cronartium quercuum f. sp. banksignae	Stem Rusts		
26008	26	008	gall rust of shortleaf pine	Cronartium quercuum f. sp. echinatae	Stem Rusts		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
26009	26	009	fusiform rust	Cronartium quercuum f. sp. fusiforme	Stem Rusts	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches.	**SRS**
26010	26	010	gall rust of virginia pine	Cronartium quercuum f. sp. virginianae	Stem Rusts		
26011	26	011	Bethuli rust	Peridermium bethuli	Stem Rusts		
26012	26	012	limb rust	Peridermium filamentosum	Stem Rusts		
26013	26	013	southern cone rust	Cronartium strobilinum	Stem Rusts		
26800	26	800	other stem rust (known)	other stem rust (known)	Stem Rusts		
26900	26	900	unknown stem rust	unknown stem rust	Stem Rusts		
27000	**27**	**000**	**Broom Rusts**			≥50% of crown area affected	**ALL**
27001	27	001	spruce broom rust	Chrysomyxa arctostaphyli	Broom Rusts	≥50% of crown area affected	**PNW-AK**
27002	27	002	Incense cedar broom rust	Gymnosporangium libocedri	Broom Rusts		
27003	27	003	juniper broom rust	Gymnosporangium nidus-avis	Broom Rusts		
27004	27	004	fir broom rust	Melampsorella caryophyllacearum	Broom Rusts		
27800	27	800	other broom rust (known)	other broom rust (known)	Broom Rusts		
27900	27	900	unknown broom rust	unknown broom rust	Broom Rusts		
30000	**30**	**000**	**Fire**			Damage ≥20% of bole circumference; >20% of stems on multi-stemmed woodland species affected; ≥20% of crown affected.	**ALL**
30001	30	001	wild fire		Fire		
30002	30	002	human caused fire		Fire		
30003	30	003	crown fire damage		Fire		
30004	30	004	ground fire damage		Fire		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
41000	**41**	**000**	**Wild Animals**			Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**ALL**
41001	41	001	bears	Ursus spp.	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**
41002	41	002	beavers	Castor canadensis	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS, PNW**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
41003	41	003	big game	big game	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW, PNW**
41004	41	004	mice or voles	mice or voles	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**
41005	41	005	pocket gophers	Geomyidae spp.	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW, PNW**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
41006	41	006	porcupines	Erethizon dorsatum	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW, PNW**
41007	41	007	rabbits or hares	Sylvilagus spp.	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**
41008	41	008	sapsuckers	Sphyrapicus spp.	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**IW; SRS; PNW-AK**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
41009	41	009	squirrels	Sciuridae spp.	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**
41010	41	010	woodpeckers	Piciformes spp.	Wild Animals		
41011	41	011	moose	Alces alces	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**PNW-AK**
41012	41	012	elk	Cervus elaphus	Wild Animals		
41013	41	013	deer	Odocoileus spp.	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
41014	41	014	feral pigs	Sus scrofa	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**
41015	41	015	mountain beaver	Aplodontia rufa	Wild Animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	**PNW**
41017	41	017	earthworms	Lumbricidae	Wild Animals		
41800	41	800	other wild animals (known)	other wild animals (known)	Wild Animals		
41900	41	900	unknown wild animals	unknown wild animals	Wild Animals		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
42000	**42**	**000**	**Domestic Animals**			Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
42001	42	001	cattle	Bos taurus	Domestic Animals		
42002	42	002	goats	Capra hircus	Domestic Animals		
42003	42	003	horses	Equus caballus	Domestic Animals		
42004	42	004	sheep	Ovis aries	Domestic Animals		
42800	42	800	other domestic animal (unknown)	other domestic animal (unknown)	Domestic Animals		
42900	42	900	unknown domestic animals	unknown domestic animals	Domestic Animals		
50000	**50**	**000**	**Abiotic Damage**			Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
50001	50	001	air pollutants		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50002	50	002	chemical		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
50003	50	003	drought		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW; NRS**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
50004	50	004	flooding/high water		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW; NRS; SRS; PNW-AK**
50005	50	005	frost		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50006	50	006	hail		Abiotic Damage		
50007	50	007	heat		Abiotic Damage		
50008	50	008	lightning		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
50009	50	009	nutrient imbalances		Abiotic Damage		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
50010	50	010	radiation		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50011	50	011	snow/ice		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
50013	50	013	wind		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**ALL**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
50014	50	014	winter injury		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50015	50	015	avalanche		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW; PNW-AK**
50016	50	016	mud-land slide		Abiotic Damage		
50017	50	017	volcano		Abiotic Damage		
50018	50	018	other geologic event		Abiotic Damage		
50019	50	019	mechanical (non-human caused)		Abiotic Damage		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
50020	50	020	saltwater injury - flooding/hurricane		Abiotic Damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**PNW**
50800	50	800	other abiotic damage (known)	other abiotic damage (known)	Abiotic Damage		
50900	50	900	unknown abiotic damage	unknown abiotic damage	Abiotic Damage		
60000	**60**	**000**	**Competition**			Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC)	**ALL**
60001	60	001	Suppression		Competition Damage	Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC)	**IW**
70000	**70**	**000**	**Human Activities**			Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
70001	70	001	herbicides		Human Activities	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
70003	70	003	imbedded objects		Human Activities	Any occurrence on the bole.	**SRS; NRS**
70004	70	004	improper planting technique		Human Activities		
70005	70	005	land clearing		Human Activities	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
70006	70	006	land use conversion		Human Activities		

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
70007	70	007	logging damage		Human Activities	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
70008	70	008	mechanical		Human Activities		
70009	70	009	pesticides		Human Activities		
70010	70	010	roads		Human Activities		
70011	70	011	soil compaction		Human Activities		
70013	70	013	vehicle damage		Human Activities		
70014	70	014	road salt		Human Activities		
71000	**71**	**000**	**Harvest**			Removal of ≥10% cubic volume	**ALL**
71001	71	001	Woodland cutting		Harvest	Removal of ≥10% cubic volume	**IW**
80000	**80**	**000**	**Multi-Damage (Insect/Disease)**				
80001	80	001	aspen defoliation (caused by 12037, 12096, 25036 and 25037)		Multi-Damage (Insect/Disease)		
80002	80	002	subalpine fir mortality		Multi-Damage (Insect/Disease)		
80003	80	003	five-needle pine decline		Multi-Damage (Insect/Disease)		
80004	80	004	pinyon pine mortality		Multi-Damage (Insect/Disease)		
85000	**85**	**000**	**Invasive Plants**				

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
90000	**90**	**000**	**Other Damages and Symptoms**			Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
90001	90	001	broken top	Not recorded for multi-stemmed trees	Other Damages and symptoms	When actual length is less than total length	**NRS; IW; PNW**
90002	90	002	dead top		Other Damages and symptoms	Any occurrence	**IW; PNW; NRS**
90003	90	003	limby-wolf tree	Not recorded for non sawlog trees	Other Damages and symptoms	Damage when board foot defect is ≥10%	**IW**
90004	90	004	forked top	Not recorded for non sawlog trees	Other Damages and symptoms	Any occurrence	**PNW**
90005	90	005	forked below merch top	Not recorded for non sawlog trees	Other Damages and symptoms	Damage when board foot defect is ≥10%	**IW; PNW**
90006	90	006	crook or sweep	Not recorded for non sawlog trees	Other Damages and symptoms	Damage when board foot defect is ≥10%	**IW; PNW**
90007	90	007	checks, bole cracks	Not recorded for non sawlog trees	Other Damages and symptoms	Damage when board foot defect is ≥10%	**PNW**
90008	90	008	foliage discoloration		Other Damages and symptoms	Damage ≥20% of crown affected	**IW; NRS; PNW**
90010	90	010	dieback		Other Damages and symptoms	Damage ≥20% of crown affected	**IW; PNW; NRS**
90011	90	011	open wound		Other Damages and symptoms	Damage ≥20% of bole circumference (in a running 3-foot section) at point of occurrence	**IW; PNW**
90012	90	012	resinosis		Other Damages and symptoms	Damage ≥20% of bole circumference (in a running 3-foot section) at point of origin; ≥20% of branches affected	**PNW**

CODE	Category	Agent	Common Name	Scientific Name	General Category Designation	Threshold	REGION
90013	90	013	broken branches		Other Damages and symptoms	Damage ≥20% of branches affected	**PNW**
99000	**99**	**000**	**UNKNOWN**			Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**ALL**

Appendix 12. Reserved and Administratively Withdrawn Status by Owner and Land Designation

Note: Ordered by owner code, national to local, and reserve status, with actual and candidate areas grouped

OWNGRP[a]	OWNCD[b]	Land designation (and example)	RESERVCD[c]	ADWDRAWCD[d]	Designated by	Comments
10,20	all	Wilderness (Cohutta Wilderness, GA/TN)	1		Congress	Some of these are within National Parks, and are reserved either way.
10,20	all	Wilderness Study Area (Browns Canyon WSA, CO)	0	1	Congress, proposed	These are areas that were established by Congress during the RARE II process or in other bills. They can be/have been "released" by Congress at a future date, but until then are managed by the agency as wilderness.
10,20	all	Recommended Wilderness (Lionhead recommended wilderness, MT)	0	1	Federal unit, recommended	Areas recommended as wilderness through land management planning are managed as wilderness until Congressional action or revised Forest Plan direction.
10	all	Primitive Area (Blue Range Primitive Area, AZ)	0	1	Federal unit, recommended	Managed as Wilderness pending possible designation
10,20	all	Proposed Wilderness	0	0	not designated; recommended by legislators, interest groups, etc.	These can be proposed by anybody anywhere and the size and borders are very fluid up until the time the bill is passed (or not). No apparent impact on current management.
10,20	all	National Monument/National Volcanic Monument (Grand Staircase-Escalante, UT)	1		Executive Order or Congress	Agencies have treated these executive orders as having the force of law, with modifications requiring an act of Congress.
10,20	all	National Recreation Area (Hell's Canyon NRA, OR/ID)	1		Congress	Although the legislation of some NRAs do not preclude wood production, most do and given the emphasis is likely to be minor, so default to reserved.

OWNGRP[a]	OWNCD[b]	Land designation (and example)	RESERVCD[c]	ADWDRAWCD[d]	Designated by	Comments
10,20	all	Wild and Scenic Rivers (wild, scenic or recreational classification) (Au Sable River, MI)	1		Congress	Wood production is not an objective for any wild and scenic river (FSM 2354.42d). Harvest in segments classified as wild is excluded except under emergency conditions; harvest in segments classified as scenic or recreational is only allowed to further river management objectives. If a map of the area or other information is unavailable, use 1/4 mile on either side of the river on federal land (1/2 mile in Alaska).
10,20	all	Wild and Scenic Study Rivers (wild, scenic or recreational classification) (White Salmon River, WA)	0	1	Federal admin. unit or Congress, proposed	Includes "eligible" or "suitable" study rivers. Wood production is not allowed and harvest restrictions are similar to designated rivers (FSH 199.12 82.51). Study rivers have a default area of 1/4 mile from either side of the river on federal lands.
10	all	National Scenic Area (Mt. Pleasant, VA)	1		Congress	Although the legislation of some NSAs do not preclude wood production, most do and given the emphasis is likely to be minor, so default to reserved.
10	all	Experimental Forest (Hubbard Brook, NH)	0	0	Congress/WO	Purpose includes research and management
10	all	Experimental Range (Santa Rita, AZ)	0	0	Congress/WO	Purpose includes research and management
10	all	Research Natural Area (Limestone Jags, AK)	0	1	NFS unit	RNAs may be established through coordination with WO, but land planning done at NF level
10	all	Roadless Area (Carribean NF, PR)	0	1	NFS unit	Roadless Rule was established through coordination with WO, but land planning and future changes are done at NF level
10	all	Special Interest Area (Cape Perpetua, OR)	0	1	NFS unit	
10	all	Special Recreation Area (Bell Smith Springs, IL)	0	1	NFS unit	
10	all	Suitable for Timber Harvest	0	1	NFS unit	Areas designated in Forest Plans as suitable for harvest for a variety of purposes, but not in the timber base

OWNGRP[a]	OWNCD[b]	Land designation (and example)	RESERVCD[c]	ADWDRAWCD[d]	Designated by	Comments
10	all	Suitable for Timber Production	0	0	NFS unit	Areas designated in Forest Plans as in the timber base, and managed for multiple use
20	21	**ALL National Park Service designations on federal land**	1		Executive Order/ Congress	Some NPS units/designations are on private land: Canyon de Chelly, parts of Lake Roosevelt, Ebey's Landing, and National Historic Sites; these are NOT reserved.
20	22	Areas of Critical Environmental Concern (High Rock Canyon, NV)	0	1	BLM unit	Authorized by Congress in FLPMA to protect significant areas, designated by management units
20	22	National Conservation Areas (Kings River, CA)	0	0	Congress	NCAs are focused on limited resources for protection, many have "multiple use" as a goal
20	23	**ALL Fish and Wildlife Service designations on federal land**	1		Executive Order/ Congress	Not clear if all FWS refuges are designated by Congress or not, but timber production is not goal of the agency.
10,20,30	all	National Natural Landmark (Caledon Natural Area, VA)	0	0	USDI	Designated by USDI but managed/owned by various public entities for a wide range of conservation purposes. Ignore the landmark status and use the designation given by the land-owner to determine status .
20	25	National Estuarine Research Reserve System	1		Congress	Established in Coastal Zone Management Act of 1972 for research and protection; managed by NOAA
30	all	State or local Parks	1		State or local Parks Dept	Rarely specifically designated by law, but laws defining agency goals preclude management for timber production
30	all	State or local Wilderness	1		State or local Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Wilderness preclude management for timber production.
30	31	State Wild River	1		State Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Wild Rivers preclude management for timber production.

OWNGRP[a]	OWNCD[b]	Land designation (and example)	RESERVCD[c]	ADWDRAWCD[d]	Designated by	Comments
30	all	State or local Reserve	1		State or local Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Reserves preclude management for timber production.
30	31	State Forests	0	0	State Forestry Dept	Usually managed by state agencies for multiple values, including production of timber products
40	all	**All private lands**	0	0		All private lands, including those owned by some conservation groups, those with conservation easements, and tribal protected areas, are considered unreserved

[a] OWNGRP: Owner group code. Ownership (or the managing Agency for public lands) of the land in the condition class; A broader group of landowner classes than OWNCD.
[b] OWNCD: Owner class code. The class in which the landowner (at the time of the inventory) belongs.
[c] RESERVCD: Reserved from timber production. Timber harvest may still be allowed for other land management objectives. See description for Reserved Status.
[d] ADWDRAWCD: Administratively withdrawn from timber production. Timber harvest may still be allowed for other land management objectives. See description for Administratively Withdrawn Status.

Appendix 13. Ownership Prefield Procedures

A13.1 Introduction

FIA uses ownership information for multiple purposes. Initially, it is used to identify and contact ownerships and gain access to the land. Ownership variables are important for quantifying what types of ownerships own how much land and among other things, the relative differences among the forests owned by different types of ownerships. FIA's National Woodland Owner uses name and address information to contact landowners and invite them to participate in the ownership survey. This chapter describes the variables and protocols for data related to land ownership collected prior to measurement of field (i.e., P2) variables.

The (core) ownership variables described below are required for the first private, forested condition encountered on a plot. Ownership information is optional for:

- Other ownerships (private or public) on the plot; and
- Other ownerships associated with the plot – e.g., other ownerships who may need to be contacted in order to gain access to the plot.

It is often difficult to know if a plot has a forested condition before it is visited, so it is often more efficient to collect the ownership information for all plots that are likely to have one or more forested conditions. For remeasured plots, ownership information should be auto-filled from history files, verified using current sources, and then, where necessary, changed/modified. A look-up table containing the most common ownerships in a State should be utilized to expedite and improve ownership data collection.

Rules for entering name and address information:

- As a rule of thumb, enter name and address information as it should appear on a mailing label
- Use upper and lower case letters
- Avoid unnecessary punctuation
- If initials are recorded, leave a space between them (e.g., W W)
- Unless part of an official name (e.g., U S Steel), the only acceptable abbreviations are:
    - Inc, Co (for company), LLC, LLP, and similar business abbreviations
    - Mr, Ms, Mrs, …
    - c/o and attn:
    - Jr, Sr, II, III, …
- Use numbers for street number, e.g., 3rd Ave not Third Ave
- If there is a PO Box and a street address, record the PO Box information in ADDRESS LINE 1 and the street address in ADDRESS LINE 2 and, if necessary, ADDRESS LINE 3.
- If there is an apartment or suite number, record it at end of the street address (on the same line).

Examples are included in section A13.57.1.

A13.2 STATE

See Core Field Guide variable 1.1.

A13.3 COUNTY

See Core Field Guide variable 1.2.

A13.4 PLOT NUMBER

See Core Field Guide variable 1.3.

A13.5 INVYEAR

The year the plot is inventoried.

When collected: All owners recorded for a plot
Field width: 4 digits
Tolerance: No errors
MQO: At least 99% of the time
Values: ≥ 2012

A13.6 OWNERSHIP TYPE

Record whether the ownership information corresponds to an ownership that (likely) owns part or all of the plot (OWNER TYPE = 1) or the information was collected for access purposes (OWNER TYPE = 2).

When collected: All ownerships recorded for a plot
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
1	Ownership information corresponds to a potential plot ownership
2	Ownership information collected for plot access purposes

A13.6.1 OWNERSHIP CONDITION LIST

Record each condition number that is present on the defined owner. If OWNER TYPE = 2, then enter 0000 to indicate information is for plot access purposes and none of the plot falls on this respective owner.

When collected: All OWNER CLASSes on CONDITION CLASS STATUS = 1, 2 and 5 (with the exception of rights-of-way owned by Federal, State, or Local governments)
Field width: 4 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: 0000 to 9876

A13.7 PLOT CENTER OWNER (CORE OPTIONAL)

Record whether the ownership information corresponds to the ownership that most likely owns plot center

When collected: All ownerships recorded for a plot
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
0	The ownership is not the likely owner of plot center
1	The ownership is the likely owner of plot center

A13.8 OWNER SHORT NAME

An alphanumeric code that can be used to quickly enter frequently encountered ownerships. These codes are assigned by regional offices.

When collected: All ownerships recorded for a plot
Field width: 50 characters

Tolerance: No errors
MQO: At least 99% of the time
Values: Letters and numbers. Null values are permissible

A13.9 AGENCY

Record the name of the public agency that owns the forest land as indicated by public tax records or other data sources. “Care of” (e.g., c/o), “attention” (e.g., attn:), and similar information should be recorded in ATTENTION.

When collected: CORE: All public plot ownerships (OWNER CLASS = 11, 12, 13, 21, 22, 23, 24, 25, 31, 32, or 33 and OWNER TYPE = 1)
CORE OPTIONAL: All public agencies recorded for a plot (OWNER CLASS = 11, 12, 13, 21, 22, 23, 24, 25, 31, 32, or 33 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.10 COMPANY

Record the name of the company or organization that owns the forest land as indicated by public tax records or other data sources. “Care of” (e.g., c/o), “attention” (e.g., attn:), and similar information should be recorded in ATTENTION.

When collected: CORE: All corporate and other private organization plot ownerships (OWNER CLASS = 41, 42, 43, or 44 and OWNER TYPE = 1)
CORE OPTIONAL: All corporate and other organization ownerships and public agencies recorded for a plot (OWNER CLASS = 41, 42, 43, or 44 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.11 MANAGEMENT UNIT

If available, record the name of the management unit that owns the forest land as indicated by public tax records or other data sources.

When collected: CORE: All public and private plot ownerships (OWNER TYPE = 1)
CORE OPTIONAL: All public and private ownerships recorded for a plot (OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.12 NAME

Record the name of the ownership. All of the information available in the public tax records or other sources should be included. The name should be formatted as if one were addressing an envelope. “Care of” (e.g., c/o), “attention” (e.g., attn:), and similar information should be recorded in ATTENTION.
When collected: CORE: All individual and family plot ownerships (OWNER CLASS = 45 and OWNER TYPE = 1)
CORE OPTIONAL: All individual and family ownerships recorded for a plot (OWNER CLASS = 45 and OWNER TYPE ≥ 1)

Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters

A13.13 ATTENTION

If applicable, “care of” (e.g., c/o), “attention” (e.g., attn:), and similar information should be recorded here. If available, job title should be included in this field.

When collected: CORE: All private plot ownerships (OWNER CLASS ≥ 41 and OWNER TYPE = 1)
CORE OPTIONAL: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.14 ADDRESS LINE 1

Record the first line of the mailing address for the ownership. If there is a PO Box and a street address, record the PO Box information in ADDRESS LINE 1 and the street address in ADDRESS LINE 2 and ADDRESS LINE 3. If there is an apartment or suite number, record it at end of the street address (on the same line).

When collected: CORE: All private plot ownerships (OWNER CLASS ≥ 41 and OWNER TYPE = 1)
CORE OPTIONAL: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.15 ADDRESS LINE 2

Where applicable, record the second line of the mailing address for the ownership.

When collected: CORE: All private plot ownerships (OWNER CLASS ≥ 41 and OWNER TYPE = 1)
CORE OPTIONAL: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters. Null values are permissible

A13.16 ADDRESS LINE 3

Where applicable, record the third line of the mailing address for the ownership.

When collected: CORE: All private plot ownerships (OWNER CLASS ≥ 41 and OWNER TYPE = 1)
CORE OPTIONAL: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors

MQO: At least 95% of the time
Values: Letters, numbers, and special characters. Null values are permissible

A13.17 ADDRESS CITY

Record the city of the mailing address for the ownership.

When collected: CORE: All private plot ownerships (OWNER CLASS ≥ 41 and OWNER TYPE = 1)
CORE OPTIONAL: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 100 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters

A13.18 ADDRESS STATE

For ownerships with mailing addresses in the United States (including territories and protectorates), record the state of the mailing address for the ownership.

When collected: CORE: All private plot ownerships with mailing addresses in the United States (OWNER CLASS ≥ 41 and OWNER TYPE = 1 and ADDRESS COUNTRY = “US”)
CORE OPTIONAL: All ownerships recorded for a plot with mailing addresses in the United States (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1 and ADDRESS COUNTRY = “US”)
Field width: 2 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: See section A13.57.2

A13.19 ADDRESS PROVINCE

For ownerships with mailing addresses outside of the United States, record the province, state, or other pertinent geographic division of the mailing address of the ownership.

When collected: CORE: All private plot ownerships with mailing addresses outside of the United States (OWNER CLASS ≥ 41 and OWNER TYPE = 1 and ADDRESS COUNTRY ≠ “US”)
CORE OPTIONAL: All ownerships recorded for a plot with mailing addresses outside of the United States (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1 and ADDRESS COUNTRY ≠ “US”)
Field width: 50 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters

A13.20 ADDRESS POSTAL CODE

Record the postal code of the mailing address for the ownership. Postal codes for US and foreign addresses should be included here.

When collected: CORE: All private plot ownerships with mailing addresses in the United States (OWNER CLASS ≥ 41 and OWNER TYPE = 1 and ADDRESS COUNTRY = “US”)

CORE OPTIONAL: All ownerships recorded for a plot with mailing addresses in the United States (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1 and ADDRESS COUNTRY = “US”)

Field width: 10 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Alphanumeric

A13.21 ADDRESS COUNTRY

Record the two-character code for the country of the mailing address for the ownership. The default value is United States (US).

When collected: CORE: All private plot ownerships (OWNER CLASS ≥ 41 and OWNER TYPE = 1)
CORE OPTIONAL: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)

Field width: 2 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: See section A13.57.3

A13.22 OWNERSHIP PHONE NUMBER 1 (CORE OPTIONAL)

When available, record the primary phone number for the ownership, including area code. If available, record the extension in OWNER PHONE NUMBER 1 EXTENSION. It should be formatted as numbers separated by dashes (e.g., “123-456-7890”).

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)

Field width: 12 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Numbers and the special character ‘-’ (dash). Null values are permissible

A13.23 OWNERSHIP PHONE NUMBER 1 EXTENSION (CORE OPTIONAL)

When available, record the extension associated with the primary phone number for the ownership.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)

Field width: 5 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: Numbers. Null values are permissible

A13.24 OWNERSHIP PHONE NUMBER 1 TYPE (CORE OPTIONAL)

When available, record whether the phone number is a work, home, mobile, or other number.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)

Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time

Values:

Values	Description
1	Work
2	Home
3	Mobile
4	Other

Null values are permissible

A13.25 OWNERSHIP PHONE NUMBER 2 (CORE OPTIONAL)

When available, record the secondary phone number for the ownership, including area code. If available, record the extension in OWNER PHONE NUMBER 2 EXTENSION. It should be formatted as numbers separated by dashes (e.g., “123-456-7890”).

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 12 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Numbers and the special character ‘-‘ (dash). Null values are permissible

A13.26 OWNERSHIP PHONE NUMBER 2 EXTENSION (CORE OPTIONAL)

When available, record the extension associated with the secondary phone number for the ownership.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 5 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: Numbers. Null values are permissible

A13.27 OWNERSHIP PHONE NUMBER 2 TYPE (CORE OPTIONAL)

When available, record whether the phone number is a work, home, mobile, or other number.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Values	Description
1	Work
2	Home
3	Mobile
4	Other

Null values are permissible

A13.28 OWNERSHIP E-MAIL ADDRESS (CORE OPTIONAL)

When available, record the e-mail address for the ownership.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters. Null values are permissible

A13.29 DATA SOURCE (CORE OPTIONAL)

Record the data source used to determine the ownership (e.g., tax office, GIS, owner, etc.).

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Values	Description
1	Tax office
2	GIS
3	Owner
4	Other

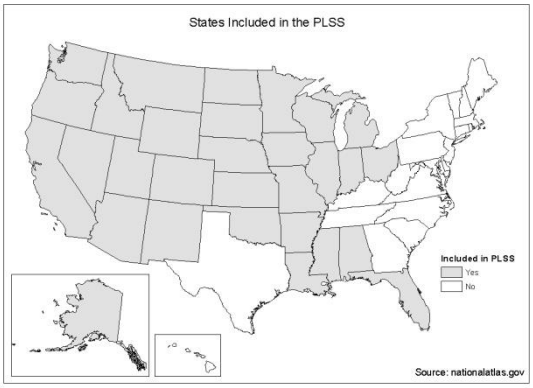
A13.30 DATA SOURCE OTHER (CORE OPTIONAL)

If “other” data source is indicated, specify what it is.

When collected: When DATA SOURCE = 4
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.31 MERIDIAN (CORE OPTIONAL)

Record the Principal Meridian that, in conjunction with TOWNSHIP, RANGE, SECTION, QUARTER SECTION, QUARTER-QUARTER SECTION, and QUARTER-QUARTER-QUARTER SECTION, can be used to relocate the ownership information. This information is only applicable to parts of the United States that use the Public Land Survey System (PLSS) Township-Range-Section (TRS) cadastral system:



When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 2 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: See section A13.57.4

A13.32 TOWNSHIP (CORE OPTIONAL)

Record the Township that, in conjunction with MERIDIAN, RANGE, SECTION, QUARTER SECTION, QUARTER-QUARTER SECTION, and QUARTER-QUARTER-QUARTER SECTION, can be used to relocate the ownership information. The information should be recorded as the number followed by a cardinal direction (e.g., 4N). This information is only applicable to parts of the United States that use the TRS cadastral system.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 4 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters and numbers

A13.33 RANGE (CORE OPTIONAL)

Record the Range that, in conjunction with MERIDIAN, TOWNSHIP, SECTION, QUARTER SECTION, QUARTER-QUARTER SECTION, and QUARTER-QUARTER-QUARTER SECTION, can be used to relocate the ownership information. The information should be recorded as the number followed by a cardinal direction (e.g., 10W). This information is only applicable to parts of the United States that use the TRS cadastral system.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 4 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters and numbers

A13.34 SECTION (CORE OPTIONAL)

Record the Section that, in conjunction with MERIDIAN, TOWNSHIP, RANGE, QUARTER SECTION, QUARTER-QUARTER SECTION, and QUARTER-QUARTER-QUARTER SECTION, can be used to relocate the ownership information. This information is only applicable to parts of the United States that use the TRS cadastral system.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 2 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: 01 - 36

A13.35 QUARTER SECTION (CORE OPTIONAL)

Record the Quarter Section that, in conjunction with MERIDIAN, TOWNSHIP, RANGE, SECTION, QUARTER-QUARTER SECTION, and QUARTER-QUARTER-QUARTER SECTION, can be used to relocate the ownership information. This information is only applicable to parts of the United States that use the TRS cadastral system.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Values	Description
1	NE
2	SE
3	SW
4	NW

A13.36 QUARTER QUARTER SECTION (CORE OPTIONAL)

Record the Section that, in conjunction with MERIDIAN, TOWNSHIP, RANGE, SECTION, QUARTER SECTION, and QUARTER-QUARTER-QUARTER SECTION, can be used to relocate the ownership information. This information is only applicable to parts of the United States that use the TRS cadastral system.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Values	Description
1	NE
2	SE
3	SW
4	NW

A13.37 QUARTER QUARTER QUARTER SECTION (CORE OPTIONAL)

Record the Section that, in conjunction with MERIDIAN, TOWNSHIP, RANGE, SECTION, QUARTER SECTION, and QUARTER-QUARTER SECTION, can be used to relocate the ownership information. This information is only applicable to parts of the United States that use the TRS cadastral system.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Values	Description
1	NE
2	SE
3	SW
4	NW

A13.38 MAP NUMBER (CORE OPTIONAL)

Record the map number that, in conjunction with DATA SOURCE, BLOCK NUMBER, and PARCEL NUMBER, can be used to relocate the ownership information. This is most useful in the parts of the United States that use metes and bounds cadastral systems.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.39 BLOCK NUMBER (CORE OPTIONAL)

Record the block number that, in conjunction with DATA SOURCE, MAP NUMBER, and PARCEL NUMBER, can be used to relocate the ownership information. This is most useful in the parts of the United States that use metes and bounds cadastral systems.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.40 PARCEL NUMBER (CORE OPTIONAL)

Record the parcel number that, in conjunction with DATA SOURCE, MAP NUMBER, and BLOCK NUMBER, can be used to relocate the ownership information. This is most useful in the parts of the United States that use metes and bounds cadastral systems.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Letters, numbers, and special characters

A13.41 TRACT SIZE (CORE OPTIONAL)

Record the total size (acres) of the tract/parcel. This information can be obtained from public tax records. Round to the nearest whole number.

When collected: All plot ownerships (OWNER CLASS ≥ 11 and OWNER TYPE = 1)
Field width: 7 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: 0000000 to 9999999

A13.42 TRACT PERCENT FOREST COVER (CORE OPTIONAL)

Record the percent of the tract/parcel that is forested. This can be accomplished using GIS software (where ownership boundaries are electronically available) or by visual, dot-count, or other methods involving overlaying the boundaries and aerial photographs. Where only hardcopy paper maps are available, mentally superimposing the boundaries and aerial photographs can be used to approximate this variable. Round to the nearest whole number.

When collected: All plot ownerships (OWNER CLASS ≥ 11 and OWNER TYPE = 1)
Field width: 3 digits
Tolerance: ±10
MQO: At least 90% of the time
Values: 000 - 100

A13.43 OWNER NOTES

Record any notes that should be conveyed about the ownership and/or ownership data.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 2000 characters
Tolerance: N/A
MQO: N/A
Values: English language words, phrases and numbers. Null values are permissible

A13.44 OWNERSHIP CONTACT NAME (CORE OPTIONAL)

Record the name of the person spoken to or who otherwise responded.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: N/A
MQO: N/A
Values: English language words, phrases and numbers

A13.45 OWNERSHIP CONTACT ATTEMPT NUMBER (CORE OPTIONAL)

Record the contact attempt number.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 2 digits
Tolerance: No errors
MQO: At least 95% of the time
Values: Attempt number

A13.46 OWNERSHIP CONTACT DATE (CORE OPTIONAL)

Record the date of the attempted ownership contact. Date should be in the form DD-MON-YYYY.

When collected: When an ownership contact attempt has been made (OWNERSHIP CONTACT ATTEMPT NUMBER is not null)
Field width: 11 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Date

A13.47 OWNERSHIP CONTACT METHOD (CORE OPTIONAL)

Record the code identifying how the ownership was contacted.

When collected: All ownerships contacted
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time

Values:

Value	Description
1	In person
2	Left voice message
3	Spoke to by phone
4	Sent email
5	Sent postal mail
6	Message received on phone
7	Message received via return email
8	Message received via return mail
9	Other (notes required)

A13.48 LAND POSTED (CORE OPTIONAL)

Record the code identifying if the land is posted prohibiting trespassing.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
0	No
1	Yes

A13.49 ACCESS GRANTED (CORE OPTIONAL)

Record the code identifying if a representative of the ownership granted us access to their land. If the ownership allows access under specific arrangements (ACCESS GRANTED = 2), then record the specific arrangements in ACCESS INFORMATION DETAILS.

When collected: All ownerships contacted
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
0	No
1	Yes
2	Conditional yes (record conditions in access notes)

A13.50 ACCESS GRANTED DATE (CORE OPTIONAL)

Record the date access was granted. Date should be in the form DD-MON-YYYY.

When collected: When access has been granted (ACCESS GRANTED = 1 or 2)
Field width: 11 characters
Tolerance: No errors
MQO: At least 95% of the time
Values: Date

A13.51 ACCESS GRANTED BY(CORE OPTIONAL)

Record the name of the person from whom access was granted.

When collected: All ownerships recorded for a plot (OWNER CLASS ≥ 11 and OWNER TYPE ≥ 1)
Field width: 255 characters
Tolerance: N/A
MQO: N/A
Values: English language words, phrases and numbers

A13.52 ACCESS NOTES (CORE OPTIONAL)

Record any other information relevant to contacting and accessing the plot.

When collected: All ownerships contacted
Field width: 2,000 characters
Tolerance: N/A
MQO: N/A
Values: English language words, phrases and numbers. Null values are permissible

A13.53 OWNERSHIP REQUESTS NOTICE (CORE OPTIONAL)

Record the code identifying if the ownership wants to be notified before we access their land.

When collected: All ownerships contacted
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
0	No
1	Yes

A13.54 OWNERSHIP REQUESTS INFORMATION (CORE OPTIONAL)

Record the code identifying if the ownership representation wants us to send him or her additional information. If they do (OWNERS REQUESTS INFORMATION = 1), then record what they want in REQUESTS INFORMATION DETAILS.

When collected: All ownerships contacted
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
0	No
1	Yes

A13.55 INFORMATION REQUEST DETAILS (CORE OPTIONAL)

Record any other information relevant to contacting and accessing the plot.

When collected: All ownerships requesting additional information (OWNERS REQUESTS INFORMATION = 1)

Field width: 2,000 characters
Tolerance: N/A
MQO: N/A
Values: English language words, phrases and numbers. Null values are permissible

A13.56 INFORMATION REQUEST FULFILLED (CORE OPTIONAL)

Record if the information request has been fulfilled and not further action is required.

When collected: All ownerships contacted
Field width: 1 digit
Tolerance: No errors
MQO: At least 95% of the time
Values:

Value	Description
0	Information request has NOT been fulfilled
1	Information request has been fulfilled

A13.57 Supplemental Information for Ownership Prefield Procedures

A13.57.1 FIA Ownership Data Recording Examples

Example 1 – U.S. Forest Service

AGENCY: USDA Forest Service
COMPANY:
MANAGEMENT UNIT: Siuslaw National Forest, Hebo Ranger District
NAME:
ATTENTION:
ADDRESS LINE 1: P.O. Box 235
ADDRESS LINE 2: 31525 Hwy 22
ADDRESS LINE 3:
ADDRESS CITY: Hebo
ADDRESS STATE: OR
ADDRESS PROVINCE:
ADDRESS POSTAL CODE: 97122
ADDRESS COUNTRY:

Example 2 – State Forestry Agency

AGENCY: Pennsylvania Department of Conservation and Natural Resources
COMPANY:
MANAGEMENT UNIT: William Penn State Forest
NAME:
ATTENTION:
ADDRESS LINE 1: 845 Park Rd
ADDRESS LINE 2:
ADDRESS LINE 3:
ADDRESS CITY: Elverson
ADDRESS STATE: PA
ADDRESS PROVINCE:
ADDRESS POSTAL CODE: 19520
ADDRESS COUNTRY:

Example 3 – Company with c/o

AGENCY:
COMPANY: Generic Tree Company
MANAGEMENT UNIT:
NAME:
ATTENTION: c/o Jane Doe, Chief Forester
ADDRESS LINE 1: PO Box 456
ADDRESS LINE 2: 123 S Main St
ADDRESS LINE 3:
ADDRESS CITY: Somewhere
ADDRESS STATE: AL
ADDRESS PROVINCE:
ADDRESS POSTAL CODE: 12345-1234
ADDRESS COUNTRY:

Example 4 – Company with foreign address

AGENCY:
COMPANY: Trees R Us
MANAGEMENT UNIT:
NAME:
ATTENTION:
ADDRESS LINE 1: 1 Spruce Blvd Ste 100
ADDRESS LINE 2:
ADDRESS LINE 3:
ADDRESS CITY: Somewhere
ADDRESS STATE:
ADDRESS PROVINCE: AB
ADDRESS POSTAL CODE: A1B 2C3
ADDRESS COUNTRY: CA

Example 5 – Single individual

AGENCY:
COMPANY:
MANAGEMENT UNIT:
NAME: Mr John D Doe
ATTENTION:
ADDRESS LINE 1: 2 Birch Pl
ADDRESS LINE 2:
ADDRESS LINE 3:
ADDRESS CITY: Somewhere
ADDRESS STATE: AL
ADDRESS PROVINCE:
ADDRESS POSTAL CODE: 12345-1234
ADDRESS COUNTRY:

Example 6 – Multiple individuals

AGENCY:
COMPANY:
NAME: Jane and Jack Doe
MANAGEMENT UNIT:
ATTENTION:
ADDRESS LINE 1: 3 Oak Ln
ADDRESS LINE 2:
ADDRESS LINE 3:
ADDRESS CITY: Somewhere
ADDRESS STATE: AL

ADDRESS PROVINCE:
ADDRESS POSTAL CODE: 12345-1234
ADDRESS COUNTRY:

Example 7 – Estate

AGENCY:
COMPANY:
MANAGEMENT UNIT:
NAME: Jennifer A Smith Estate
ATTENTION:
ADDRESS LINE 1: 4 Pine Ave
ADDRESS LINE 2:
ADDRESS LINE 3:
ADDRESS CITY: Somewhere
ADDRESS STATE: AL
ADDRESS PROVINCE:
ADDRESS POSTAL CODE: 12345-1234
ADDRESS COUNTRY:

A13.57.2 Two-letter Abbreviations for U.S. States, Territories, and Protectorates

Source: National Institute of Standards and Technology. 1987. Codes for the identification of the States, District of Columbia and the outlying areas of the United States, and associated areas. Washington, DC: U.S. Department of Commerce, National Institute of Standards and Technology. Federal Information Processing Standards (FIPS) Publication 5-2. http://www.itl.nist.gov/fipspubs/fip5-2.htm (last accessed: March 28, 2007)

Name	Code	Name	Code
Alabama	AL	New Jersey	NJ
Alaska	AK	New Mexico	NM
Arizona	AZ	New York	NY
Arkansas	AR	North Carolina	NC
California	CA	North Dakota	ND
Colorado	CO	Ohio	OH
Connecticut	CT	Oklahoma	OK
Delaware	DE	Oregon	OR
District of Columbia	DC	Pennsylvania	PA
Florida	FL	Rhode Island	RI
Georgia	GA	South Carolina	SC
Hawaii	HI	South Dakota	SD
Idaho	ID	Tennessee	TN
Illinois	IL	Texas	TX
Indiana	IN	Utah	UT
Iowa	IA	Vermont	VT
Kansas	KS	Virginia	VA
Kentucky	KY	Washington	WA
Louisiana	LA	West Virginia	WV
Maine	ME	Wisconsin	WI
Maryland	MD	Wyoming	WY
Massachusetts	MA	American Samoa	AS

Name	Code	Name	Code
Michigan	MI	Federated States of Micronesia	FM
Minnesota	MN	Guam	GU
Mississippi	MS	Marshall Islands	MH
Missouri	MO	Northern Mariana Islands	MP
Montana	MT	Palau	PW
Nebraska	NE	Puerto Rico	PR
Nevada	NV	U.S. Minor Outlying Islands	UM
New Hampshire	NH	Virgin Islands of the U.S.	VI

A13.57.3 Country Codes

Source: International Organization for Standardization. 2006. Codes for the representation of names of countries and their subdivisions – Part 1: Country codes. Geneva, Switzerland: International Organization for Standardization. ISO 3166-1: 2006. 69 p.

Country	Code
Afghanistan	AF
Åland Islands	AX
Albania	AL
Algeria	DZ
American Samoa	AS
Andorra	AD
Angola	AO
Anguilla	AI
Antarctica	AQ
Antigua and Barbuda	AG
Argentina	AR
Armenia	AM
Aruba	AW
Australia	AU
Austria	AT
Azerbaijan	AZ
Bahamas	BS
Bahrain	BH
Bangladesh	BD
Barbados	BB
Belarus	BY
Belgium	BE
Belize	BZ
Benin	BJ
Bermuda	BM
Bhutan	BT
Bolivia	BO
Bosnia and Herzegovina	BA
Botswana	BW
Bouvet Island	BV
Brazil	BR
British Indian Ocean Territory	IO
Brunei Darussalam	BN
Bulgaria	BG
Burkina Faso	BF
Burundi	BI
Cambodia	KH
Cameroon	CM
Canada	CA
Cape Verde	CV
Cayman Islands	KY
Central African Republic	CF
Chad	TD
Chile	CL
China	CN
Christmas Island	CX
Cocos (Keeling) Islands	CC
Colombia	CO
Comoros	KM
Congo	CG
Congo, The Democratic Republic of The	CD
Cook Islands	CK
Costa Rica	CR
Côte D'Ivoire	CI
Croatia	HR
Cuba	CU
Cyprus	CY
Czech Republic	CZ
Denmark	DK
Djibouti	DJ
Dominica	DM
Dominican Republic	DO
Ecuador	EC
Egypt	EG
El Salvador	SV
Equatorial Guinea	GQ
Eritrea	ER
Estonia	EE
Ethiopia	ET
Falkland Islands (Malvinas)	FK
Faroe Islands	FO
Fiji	FJ
Finland	FI
France	FR
French Guiana	GF
French Polynesia	PF
French Southern Territories	TF
Gabon	GA
Gambia	GM
Georgia	GE
Germany	DE
Ghana	GH
Gibraltar	GI
Greece	GR
Greenland	GL
Grenada	GD
Guadeloupe	GP
Guam	GU
Guatemala	GT
Guernsey	GG
Guinea	GN
Guinea-Bissau	GW
Guyana	GY
Haiti	HT
Heard Island and Mcdonald Islands	HM
Holy See (Vatican City State)	VA
Honduras	HN
Hong Kong	HK
Hungary	HU
Iceland	IS

Country	Code
India	IN
Indonesia	ID
Iran, Islamic Republic of	IR
Iraq	IQ
Ireland	IE
Isle of Man	IM
Israel	IL
Italy	IT
Jamaica	JM
Japan	JP
Jersey	JE
Jordan	JO
Kazakhstan	KZ
Kenya	KE
Kiribati	KI
Korea, Democratic People's Republic of	KP
Korea, Republic of	KR
Kuwait	KW
Kyrgyzstan	KG
Lao People's Democratic Republic	LA
Latvia	LV
Lebanon	LB
Lesotho	LS
Liberia	LR
Libyan Arab Jamahiriya	LY
Liechtenstein	LI
Lithuania	LT
Luxembourg	LU
Macao	MO
Macedonia, The Former Yugoslav Republic of	MK
Madagascar	MG
Malawi	MW
Malaysia	MY
Maldives	MV
Mali	ML
Malta	MT
Marshall Islands	MH
Martinique	MQ
Mauritania	MR
Mauritius	MU
Mayotte	YT
Mexico	MX
Micronesia, Federated States of	FM
Moldova, Republic of	MD
Monaco	MC
Mongolia	MN
Montenegro	ME
Montserrat	MS

Country	Code
Morocco	MA
Mozambique	MZ
Myanmar	MM
Namibia	NA
Nauru	NR
Nepal	NP
Netherlands	NL
Netherlands Antilles	AN
New Caledonia	NC
New Zealand	NZ
Nicaragua	NI
Niger	NE
Nigeria	NG
Niue	NU
Norfolk Island	NF
Northern Mariana Islands	MP
Norway	NO
Oman	OM
Pakistan	PK
Palau	PW
Palestinian Territory, Occupied	PS
Panama	PA
Papua New Guinea	PG
Paraguay	PY
Peru	PE
Philippines	PH
Pitcairn	PN
Poland	PL
Portugal	PT
Puerto Rico	PR
Qatar	QA
Réunion	RE
Romania	RO
Russian Federation	RU
Rwanda	RW
Saint Helena	SH
Saint Kitts and Nevis	KN
Saint Lucia	LC
Saint Pierre and Miquelon	PM
Saint Vincent and The Grenadines	VC
Samoa	WS
San Marino	SM
Sao Tome and Principe	ST
Saudi Arabia	SA
Senegal	SN
Serbia	RS
Seychelles	SC
Sierra Leone	SL
Singapore	SG
Slovakia	SK

Country	Code
Slovenia	SI
Solomon Islands	SB
Somalia	SO
South Africa	ZA
South Georgia and The South Sandwich Islands	GS
Spain	ES
Sri Lanka	LK
Sudan	SD
Suriname	SR
Svalbard and Jan Mayen	SJ
Swaziland	SZ
Sweden	SE
Switzerland	CH
Syrian Arab Republic	SY
Taiwan, Province of China	TW
Tajikistan	TJ
Tanzania, United Republic of	TZ
Thailand	TH
Timor-Leste	TL
Togo	TG
Tokelau	TK
Tonga	TO
Trinidad and Tobago	TT
Tunisia	TN
Turkey	TR
Turkmenistan	TM
Turks and Caicos Islands	TC
Tuvalu	TV
Uganda	UG
Ukraine	UA
United Arab Emirates	AE
United Kingdom	GB
United States	US
United States Minor Outlying Islands	UM
Uruguay	UY
Uzbekistan	UZ
Vanuatu	VU
Vatican City State See Holy See	
Venezuela	VE
Viet Nam	VN
Virgin Islands, British	VG
Virgin Islands, U.S.	VI
Wallis and Futuna	WF
Western Sahara	EH
Yemen	YE
Zaire See Congo, The Democratic	

Country	Code
Republic of The	
Zambia	ZM
Zimbabwe	ZW

A13.57.4 Meridian Codes

Source: U.S. Geological Survey. 2003. Public land survey system of the United States. Reston, VA: U.S. Geological Survey. http://nationalatlas.gov/atlasftp.html (last accessed: March 28, 2007).

Code	Meridian/survey	State(s)
01	First Principal Meridian	Ohio and Indiana
02	Second Principal Meridian	Illinois and Indiana
03	Third Principal Meridian	Illinois
04	Fourth Principal Meridian	Illinois
05	Fifth Principal Meridian	Arkansas, Iowa, Minnesota, Missouri, North Dakota, and South Dakota
06	Sixth Principal Meridian	Colorado, Kansas, Nebraska, South Dakota, and Wyoming
07	Black Hills	South Dakota
08	Boise	Idaho
09	Chickasaw	Mississippi
10	Choctaw	Mississippi
11	Cimarron	Oklahoma
12	Copper River	Alaska
13	Fairbanks	Alaska
14	Gila And Salt River	Arizona
15	Humboldt	California
16	Huntsville	Alabama and Mississippi
17	Indian	Oklahoma
18	Louisiana	Louisiana
19	Michigan	Michigan and Ohio
20	Montana (Principal)	Montana
21	Mount Diablo	California and Nevada
22	Navajo	Arizona
23	New Mexico	Colorado and New Mexico
24	St Helena	Louisiana
25	St Stephens	Alabama and Mississippi
26	Salt Lake	Utah
27	San Bernardino	California
28	Seward	Alaska
29	Tallahassee	Florida and Alabama
30	Uintah	Utah
31	Ute	Colorado
32	Washington	Mississippi
33	Willamette	Oregon and Washington
34	Wind River	Wyoming
35	Ohio River Survey	Ohio
36	Between The Miamis	Ohio
37	Muskingum River	Ohio
38	Ohio River Base	Ohio
39	Scioto River	Ohio

Code	Meridian/survey	State(s)
40	Second Scioto River	Ohio
41	Third Scioto River	Ohio
42	Ellicotts Line	Alabama
43	Twelve-Mile Square	Ohio
44	Kateel River	Alaska
45	Umiat	Alaska
46	Fourth Principal Extended Meridian	Minnesota and Wisconsin
47	West of the Great Miami	Ohio
48	U S Military	Ohio
91	Connecticut Western Reserve	Ohio
92	Ohio Company Purchase	Ohio
99	Not Public Land Survey	

Appendix 14. Changes in the species code list (appendix 3) beginning in version 9.0 (October, 2019)

FIA Code	Common Name	Genus	Species	Kind of Change	Last field guide before change	Field guide in which change was made
10	Fir spp.	Abies	spp.	deleted	8.0	9.0
40	cedar spp.	Chamaecyparis	spp.	deleted	8.0	9.0
50	cypress	Cupressus	spp.	deleted	8.0	9.0
53	Tecate cypress	Cupressus	forbesii	capitalized common name	8.0	9.0
57	redcedar, juniper spp.	Juniperus	spp.	deleted	8.0	9.0
74	Japanese larch	Larix	kaempferi	added	-	9.0
75	Siberian larch	Larix	sibirica	added	-	9.0
90	spruce spp.	Picea	spp.	deleted	8.0	9.0
100	pine spp.	Pinus	spp.	deleted	8.0	9.0
144	Honduras pine	Pinus	elliottii	change in common name	8.0	9.0
200	Douglas-fir spp.	Pseudotsuga	spp.	deleted	8.0	9.0
220	cypress spp.	Taxodium	spp.	deleted	8.0	9.0
230	yew spp.	Taxus	spp.	deleted	8.0	9.0
240	Thuja spp.	Thuja	spp.	deleted	8.0	9.0
250	torreya (nutmeg) spp.	Torreya	spp.	deleted	8.0	9.0
260	hemlock spp.	Tsuga	spp.	deleted	8.0	9.0
304	catclaw acacia	Acacia	greggii	deleted	8.0	9.0
310	maple spp.	Acer	spp.	deleted	8.0	9.0
321	Rocky Mountain maple	Acer	glabrum	deleted	8.0	9.0
330	buckeye, horsechestnut spp.	Aesculus	spp.	deleted	8.0	9.0
336	red buckeye	Aesculus	pavia	deleted	8.0	9.0
337	painted buckeye	Aesculus	sylvatica	deleted	8.0	9.0
350	alder spp.	Alnus	spp.	deleted	8.0	9.0
360	Madrone spp.	Arbutus	spp.	deleted	8.0	9.0
370	birch spp.	Betula	spp.	deleted	8.0	9.0
376	resin birch	Betula	neoalaskana	new common name	8.0	9.0
378	northwestern paper birch	Betula	x utahensis	changed hydrid symbol to lower case	8.0	9.0
400	hickory spp.	Carya	spp.	deleted	8.0	9.0
420	chestnut spp	Castanea	spp			
450	catalpa spp.	Catalpa	spp.	deleted	8.0	9.0
460	hackberry spp.	Celtis	spp.	deleted	8.0	9.0
463	netleaf hackberry	Celtis	laevigata var reticulata	deleted	8.0	9.0
490	dogwood spp.	Cornus	spp.	deleted	8.0	9.0
520	persimmon spp.	Diospyros	spp.	deleted	8.0	9.0
522	Texas persimmon	Diospyros	texana	marked as woodland	8.0	9.0

FIA Code	Common Name	Genus	Species	Kind of Change	Last field guide before change	Field guide in which change was made
523	Anacua knockaway	Ehretia	anacua	change in common name	8.0	9.0
540	ash spp.	Fraxinus	spp.	deleted	8.0	9.0
550	locust spp.	Gleditsia	spp.	deleted	8.0	9.0
580	silverbell spp.	Halesia	spp.	deleted	8.0	9.0
583	little silverbell	Halesia	parviflora	deleted	8.0	9.0
600	walnut spp.	Juglans	spp.	deleted	8.0	9.0
650	magnolia spp.	Magnolia	spp.	deleted	8.0	9.0
680	mulberry spp.	Morus	spp.	deleted	8.0	9.0
690	tupelo spp.	Nyssa	spp.	deleted	8.0	9.0
715	Matenus palauica	Maytenus	palauica	added	-	9.0
718	kesiamel	Osmoxylon	truncatum	added	-	9.0
720	bay spp.	Persea	spp.	deleted	8.0	9.0
729	sycamore spp.	Platanus	spp.	deleted	8.0	9.0
740	cottonwood and poplar spp.	Populus	spp.	deleted	8.0	9.0
745	plains cottonwood	Populus	deltoides ssp monilifera	deleted	8.0	9.0
755	mesquite spp.	Prosopis	spp.	deleted	8.0	9.0
763	chokecherry	Prunus	virginiana	change in common name	8.0	9.0
800	oak spp.	Quercus	spp.	deleted	8.0	9.0
828	Texas red oak	Quercus	texana	change in common name	8.0	9.0
834	Shumard oak	Quercus	shumardii	new common name	8.0	9.0
852	sea torchwood	Amyris	elemifera	change in common name	8.0	9.0
853	pond-apple	Annona	glabra	change in common name	8.0	9.0
853	pond-apple	Annona	glabra	hyphen added to common name	8.0	9.0
855	sheoak spp.	Casuarina	spp.	deleted	8.0	9.0
857	belah	Casuarina	lepidophloia	new common name	8.0	9.0
858	camphortree	Cinnamomum	camphora	space deleted in common name	8.0	9.0
859	fiddlewood	Citharexylum	fruticosum	deleted	8.0	9.0
863	pigeon plum, tietongue	Coccoloba	diversifolia	change in common name	8.0	9.0
865	largeleaf geigertree	Cordia	sebestena	change in common name	8.0	9.0

FIA Code	Common Name	Genus	Species	Kind of Change	Last field guide before change	Field guide in which change was made
876	Florida strangler fig	Ficus	aurea	change in common name	8.0	9.0
877	wild banyantree, shortleaf fig,	Ficus	citrifolia	change in common name	8.0	9.0
882	beeftree, longleaf blolly	Guapira	discolor	change in common name	8.0	9.0
886	Florida poisontree	Metopium	toxiferum	change in common name	8.0	9.0
888	octopus tree, schefflera	Schefflera	actinophylla	change in common name	8.0	9.0
895	paradisetree	Simarouba	glauca	change in common name	8.0	9.0
906	Everglades palm, paurotis-palm	Acoelorraphe	wrightii	new common name	8.0	9.0
907	Florida silver palm	Coccothrinax	argentata	new common name	8.0	9.0
920	willow spp.	Salix	spp.	deleted	8.0	9.0
923	Bebb willow	Salix	bebbiana	deleted	8.0	9.0
924	Bonpland willow	Salix	bonplandiana	change in common name	8.0	9.0
934	mountain ash spp	Sorbus	spp	deleted	8.0	9.0
940	West Indian mahogany	Swietenia	mahagoni	change in common name	8.0	9.0
950	basswood spp.	Tilia	spp.	deleted	8.0	9.0
970	elm spp.	Ulmus	spp.	deleted	8.0	9.0
982	Joshua tree	Yucca	brevifolia	deleted	8.0	9.0
986	black-mangrove	Avicennia	germinans	hyphen added to common name	8.0	9.0
987	buttonwood-mangrove	Conocarpus	erectus	hyphen added to common name	8.0	9.0
990	desert ironwood	Olneya	tesota	deleted	8.0	9.0
991	saltcedar	Tamarix	spp.	deleted	8.0	9.0
5091	Washington hawthorn	Crataegus	phaenopyrum	deleted	8.0	9.0
5190	hazel alder	Alnus	serrulata	deleted	8.0	9.0
5233	devil's walkingstick	Aralia	spinosa	deleted	8.0	9.0
5322	fountain butterflybush	Buddleja	alternifolia	deleted	8.0	9.0
5328	South American jelly palm	Butia	capitate	added	-	9.0
5415	snowbrush ceanothus	Ceanothus	velutinus	deleted	8.0	9.0

FIA Code	Common Name	Genus	Species	Kind of Change	Last field guide before change	Field guide in which change was made
5432	common buttonbush	Cephalanthus	occidentalis	deleted	8.0	9.0
5444	sawara-cypress	Chamaecyparis	pisifera	added	-	9.0
	desert willow	Chilopsis	linearis	deleted	8.0	9.0
6009	black wattle	Acacia	mangium	new common name	8.0	9.0
6029	beadtree	Adenanthera	spp.	deleted	8.0	9.0
6043	mesecheues	Aglaia	palauensis	deleted	8.0	9.0
6047	Aglaia	Aglaia	spp.	deleted	8.0	9.0
6051	ailanthus	Ailanthus	spp.	deleted	8.0	9.0
6058	ukall ra ngebard	Albizia	falcataria	deleted	8.0	9.0
6063	albizia	Albizia	spp.	deleted	8.0	9.0
6073	alectryon	Alectryon	spp.	deleted	8.0	9.0
6077	aleurites	Aleurites	spp.	deleted	8.0	9.0
6083	Allophylus	Allophylus	spp.	deleted	8.0	9.0
6090	Alphitonia	Alphitonia	spp.	deleted	8.0	9.0
6097	alstonia	Alstonia	spp.	deleted	8.0	9.0
6130	Annona	Annona	spp.	deleted	8.0	9.0
6142	Antidesma ponapense	Antidesma	ponapense	deleted	8.0	9.0
6144	Antidesma sphaerocarpum	Antidesma	sphaerocarpum	deleted	8.0	9.0
6145	chinalaurel	Antidesma	spp.	deleted	8.0	9.0
6156	Norfolk Island Pine	Araucaria	excelsa	deleted	8.0	9.0
6158	Araucaria	Araucaria	spp.	deleted	8.0	9.0
6166	marlberry	Ardisia	spp.	deleted	8.0	9.0
6178	meduu	Artocarpus	spp.	deleted	8.0	9.0
6189	Astronidium	Astronidium	spp.	deleted	8.0	9.0
6199	Averrhoa	Averrhoa	spp.	deleted	8.0	9.0
6205	Avicennia	Avicennia	spp.	deleted	8.0	9.0
6216	common bamboo	Bambusa	vulgaris	deleted	8.0	9.0
6223	Barringtonia	Barringtonia	spp	deleted	8.0	9.0
6225	Bauhinia binata	Bauhinia	binata	deleted	8.0	9.0
6230	bauhinia	Bauhinia	spp.	deleted	8.0	9.0
6234	bog spicebush	Lindera	subcoriacea	deleted	8.0	9.0
6237	bishopwood	Bischofia	spp.	deleted	8.0	9.0
6239	bixa	Bixa	spp.	deleted	8.0	9.0
6245	ahakea	Bobea	spp.	deleted	8.0	9.0
6248	bocconia	Bocconia	spp.	deleted	8.0	9.0
6269	bruguiera	Bruguiera	spp.	deleted	8.0	9.0
6280	Buchanania	Buchanania	spp.	deleted	8.0	9.0
6286	dogtail	Buddleja	asiatica	deleted	8.0	9.0
6304	Puerto Rico box	Buxus	portoricensis	deleted	8.0	9.0
6337	Caloncoba echinata	Caloncoba	echinata	deleted	8.0	9.0
6345	calophyllum	Calophyllum	spp.	deleted	8.0	9.0
6347	calotropis	Calotropis	spp.	deleted	8.0	9.0
6367	kelela charm, kiu	Campnosperma	brevipetiolata	deleted	8.0	9.0
6377	Canarium	Canarium	spp.	deleted	8.0	9.0
6398	scorpionbush	Carmona	spp.	deleted	8.0	9.0
6400	Caryota	Caryota	spp.	deleted	8.0	9.0
6408	Casearia	Casearia	spp.	deleted	8.0	9.0
6420	kassod tree	Cassia	siamea	deleted	8.0	9.0
6422	Cassia	Cassia	spp.	deleted	8.0	9.0

FIA Code	Common Name	Genus	Species	Kind of Change	Last field guide before change	Field guide in which change was made
6438	catberry	Ilex	mucronata	deleted	8.0	9.0
6444	pumpwood	Cecropia	spp.	deleted	8.0	9.0
6459	chuti	Cerbera	dilatata	deleted	8.0	9.0
6463	Cerbera spp	Cerbera	spp.	deleted	8.0	9.0
6470	sweetpotato cactus	Cereus	spp.	deleted	8.0	9.0
6478	jessamine	Cestrum	spp.	deleted	8.0	9.0
6479	Knowlton's hophornbeam	Ostrya	knowltonii	deleted	8.0	9.0
6496	sandmat	Chamaesyce	spp.	deleted	8.0	9.0
6503	papala	Charpentiera	spp.	deleted	8.0	9.0
6513	cheirodendron	Cheirodendron	spp.	deleted	8.0	9.0
6518	goosefoot	Chenopodium	spp.	deleted	8.0	9.0
6553	cinchona	Cinchona	spp.	deleted	8.0	9.0
6563	cinnamon	Cinnamomum	spp.	deleted	8.0	9.0
6568	fiddlewood	Citharexylum	spp.	deleted	8.0	9.0
6569	threespike fiddlewood	Citharexylum	tristachyum	deleted	8.0	9.0
6573	key lime	Citrus	x aurantiifolia	changed hydrid symbol to lower case	8.0	9.0
6574	sour orange	Citrus	x aurantium	changed hydrid symbol to lower case	8.0	9.0
6575	lemon	Citrus	x limon	changed hydrid symbol to lower case	8.0	9.0
6576	grapefruit	Citrus	x paradisi	changed hydrid symbol to lower case	8.0	9.0
6577	sweet orange	Citrus	x sinensis	changed hydrid symbol to lower case	8.0	9.0
6578	grapefruit, kahet magas	Citrus	grandis	deleted	8.0	9.0
6592	claoxylon	Claoxylon	spp.	deleted	8.0	9.0
6595	Cleistanthus	Cleistanthus	spp.	deleted	8.0	9.0
6632	stickbush	Clerodendrum	chinense	deleted	8.0	9.0
6634	turks turbin	Clerodendrum	indicum	deleted	8.0	9.0
6642	soapbush	Clidemia	hirta	deleted	8.0	9.0
6652	attorney	Clusia	spp.	deleted	8.0	9.0
6653	deepwoods fern	Cnemidaria	horrida	deleted	8.0	9.0
6681	coconut palm	Cocos	spp.	deleted	8.0	9.0
6687	coffee	Coffea	spp.	deleted	8.0	9.0
6693	common snakebark	Colubrina	arborescens	change in common name	8.0	9.0
6694	Asian nakedwood	Colubrina	asiatica	deleted	8.0	9.0
6699	nakedwood	Colubrina	spp.	deleted	8.0	9.0
6700	Urban's nakedwood	Colubrina	verrucosa	deleted	8.0	9.0

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6702	ochaol	Combretum	tetralophum	deleted	8.0	9.0
6708	Mexican plum	Prunus	mexicana	added	-	9.0
6709	mangrove	Conocarpus	spp.	deleted	8.0	9.0
6739	Puerto Rico manjack	Cordia	rupicola	deleted	8.0	9.0
6741	cordia	Cordia	spp.	deleted	8.0	9.0
6755	corynocarpus	Corynocarpus	spp.	deleted	8.0	9.0
6759	Stansbury cliffrose	Purshia	stansburiana	deleted	8.0	9.0
6772	croton	Croton	spp.	deleted	8.0	9.0
6783	cryptocarya	Cryptocarya	spp.	deleted	8.0	9.0
6785	Havard oak	Quercus	havardii	deleted	8.0	9.0
6787	Japanese cedar	Cryptomeria	spp.	deleted	8.0	9.0
6852	queen sago	Cycas	circinalis	new species name	8.0	9.0
6854	Cycas	Cycas	spp.	deleted	8.0	9.0
6863	cyrtandra	Cyrtandra	pulchella	deleted	8.0	9.0
6866	cyrtandra	Cyrtandra	spp.	deleted	8.0	9.0
6884	delonix	Delonix	spp.	deleted	8.0	9.0
6887	Dendrocnide	Dendrocnide	spp.	deleted	8.0	9.0
6924	staghorn sumac	Rhus	typhina	deleted	8.0	9.0
6942	Drypetes	Drypetes	spp.	deleted	8.0	9.0
6955	crack willow	Salix	fragilis	added	-	9.0
6959	Geyer willow	Salix	geyeriana	deleted	8.0	9.0
6971	Dysoxylum	Dysoxylum	spp.	deleted	8.0	9.0
6972	Dysoxylum mollissimum ssp Molle	Dysoxylum	mollissimum	new common name	8.0	9.0
6983	Elaeocarpus	Elaeocarpus	spp.	deleted	8.0	9.0
6991	red elderberry	Sambucus	racemosa			
6992	utuutu	Eleocharis	dulcis	deleted	8.0	9.0
6999	loquat	Eriobotrya	spp.	deleted	8.0	9.0
7013	erythrina	Erythrina	spp.	deleted	8.0	9.0
7016	tiger's claw	Erythrina	variegata	corrected species name spelling	8.0	9.0
7059	edebsachel, chedebsachel	Eugenia	aquea	deleted	8.0	9.0
7068	lathberry	Eugenia	cordata	new common name	8.0	9.0
7082	makupa, malay apple	Eugenia	malaccensis	deleted	8.0	9.0
7117	Longan	Euphoria	longana	deleted	8.0	9.0
7120	eurya	Eurya	spp.	deleted	8.0	9.0
7127	Euodia	Euodia	spp.	deleted	8.0	9.0
7132	exocarpos	Exocarpos	spp.	deleted	8.0	9.0
7143	Fagraea	Fagraea	spp.	deleted	8.0	9.0
7145	peacocksplume	Falcataria	spp.	deleted	8.0	9.0
7193	bushweed	Flueggea	spp.	deleted	8.0	9.0
7200	California buckthorn	Frangula	californica	deleted	8.0	9.0
7205	Goodding's ash	Fraxinus	gooddingii	deleted	8.0	9.0
7209	fuchsia	Fuchsia	spp.	deleted	8.0	9.0
7221	Garcinia	Garcinia	spp.	deleted	8.0	9.0

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7246	lotebush	Ziziphus	obtusifolia	deleted	8.0	9.0
7253	Gmelina	Gmelina	spp.	deleted	8.0	9.0
7274	grevillea	Grevillea	spp.	deleted	8.0	9.0
7275	fau ui	Grewia	crenata	deleted	8.0	9.0
7279	lignum-vitae	Guajacum	officinale	corrected genus spelling	8.0	9.0
7312	Guioa	Guioa	spp.	deleted	8.0	9.0
7329	Ozark witchhazel	Hamamelis	vernalis	deleted	8.0	9.0
7331	American witchhazel	Hamamelis	virginiana	deleted	8.0	9.0
7340	Hedycarya	Hedycarya	spp.	deleted	8.0	9.0
7350	heliocarpus	Heliocarpus	spp.	deleted	8.0	9.0
7362	Heritiera	Heritiera	spp.	deleted	8.0	9.0
7367	Hernandia	Hernandia	spp.	deleted	8.0	9.0
7373	island-aster	Hesperomannia	spp.	deleted	8.0	9.0
7376	toyon	Heteromeles	spp.	deleted	8.0	9.0
7390	hibiscadelphus	Hibiscadelphus	spp.	deleted	8.0	9.0
7411	rosemallow	Hibiscus	spp.	deleted	8.0	9.0
7431	Horsfieldia	Horsfieldia	spp.	deleted	8.0	9.0
7440	nightblooming cactus	Hylocereus	spp.	deleted	8.0	9.0
7441	nightblooming cactus	Hylocereus	undatus	deleted	8.0	9.0
7442	West Indian locust, Brazilian cherry, stinkingtoe	Hymenaea	courbaril	change to common name	8.0	9.0
7448	Canary Island St Johnswort	Hypericum	canariense	deleted	8.0	9.0
7464	holly	Ilex	spp.	deleted	8.0	9.0
7466	Ilex urbaniana	Ilex	urbaniana var riedlaei	deleted	8.0	9.0
7483	jacaranda	Jacaranda	spp.	deleted	8.0	9.0
7490	chirriador	Jacquinia	umbellata	deleted	8.0	9.0
7494	nettlespurge	Jatropha	spp.	deleted	8.0	9.0
7508	Koanophyllon polyodon	Koanophyllon	polyodon	deleted	8.0	9.0
7513	treecotton	Kokia	spp.	deleted	8.0	9.0
7517	Kunzea	Kunzea	spp.	deleted	8.0	9.0
7566	leadtree	Leucaena	spp.	deleted	8.0	9.0
7574	Amur privet	Ligustrum	amurense	deleted	8.0	9.0
7575	Chinese privet	Ligustrum	sinense	deleted	8.0	9.0
7576	privet	Ligustrum	spp.	deleted	8.0	9.0
7580	southern spicebush	Lindera	melissifolia	deleted	8.0	9.0
7587	Litsea	Litsea	spp.	deleted	8.0	9.0
7598	Egg Fruit / Canistel	Lucuma	nervosa	deleted	8.0	9.0
7604	lunania	Lunania	spp.	deleted	8.0	9.0
7616	Macadamia	Macadamia	spp.	deleted	8.0	9.0
7623	macaranga	Macaranga	spp.	deleted	8.0	9.0
7631	star magnolia	Magnolia	stellata	added	-	9.0
7634	Chinese magnolia	Magnolia	x soulangiana	added	-	9.0
7638	Mallotus palauensis	Mallotus	palauensis	deleted	8.0	9.0

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7641	mallotus	Mallotus	spp.	deleted	8.0	9.0
7643	Singapore holly	Malpighia	coccigera	deleted	8.0	9.0
7655	Mammea	Mammea	spp.	deleted	8.0	9.0
7659	mango	Mangifera	spp.	deleted	8.0	9.0
7663	Surinam bulletwood	Manikara	bidenta	new common name	8.0	9.0
7671	Manilkara	Manilkara	spp.	deleted	8.0	9.0
7680	dermarm	Marattia	fraxinea	deleted	8.0	9.0
7706	Medusanthera	Medusanthera	spp.	deleted	8.0	9.0
7709	melaleuca	Melaleuca	spp.	deleted	8.0	9.0
7716	melia	Melia	spp.	deleted	8.0	9.0
7767	melochia	Melochia	spp.	deleted	8.0	9.0
7778	Meryta	Meryta	spp.	deleted	8.0	9.0
7793	lehua	Metrosideros	spp.	deleted	8.0	9.0
7800	Metroxylon	Metroxylon	spp.	deleted	8.0	9.0
7842	montanoa	Montanoa	spp.	deleted	8.0	9.0
7848	bayberry	Morella	spp.	deleted	8.0	9.0
7852	morinda	Morinda	spp.	deleted	8.0	9.0
7868	muntingia	Muntingia	spp.	deleted	8.0	9.0
7876	meia	Musa	spp.	deleted	8.0	9.0
7880	Mussaenda frondosa	Mussaenda	frondosa	deleted	8.0	9.0
7882	Mussaenda	Mussaenda	spp.	deleted	8.0	9.0
7884	myoporum	Myoporum	spp.	deleted	8.0	9.0
7892	rodwood	Myrcia	spp.	deleted	8.0	9.0
7900	sweetgale	Myrica	spp.	deleted	8.0	9.0
7904	Myristica	Myristica	spp.	deleted	8.0	9.0
7927	colicwood	Myrsine	spp.	deleted	8.0	9.0
7956	oleander	Nerium	oleander	deleted	8.0	9.0
7961	nestegis	Nestegis	spp.	deleted	8.0	9.0
7965	tobacco	Nicotiana	spp.	deleted	8.0	9.0
7970	aiea	Nothocestrum	spp.	deleted	8.0	9.0
7977	ochna	Ochna	spp.	deleted	8.0	9.0
7986	yellowwood	Ochrosia	spp.	deleted	8.0	9.0
8000	oleandra fern	Oleandra	neriiformis	deleted	8.0	9.0
8007	olive	Olea	spp.	deleted	8.0	9.0
8010	Homalanthus	Homalanthus	spp.	deleted	8.0	9.0
8011	Ophiorrhiza palauensis	Ophiorrhiza	palauensis	deleted	8.0	9.0
8013	cochineal nopal cactus	Opuntia	cochenillifera	deleted	8.0	9.0
8014	tuna cactus	Opuntia	ficus-indica	deleted	8.0	9.0
8015	common pricklypear	Opuntia	monacantha	deleted	8.0	9.0
8018	pricklypear	Opuntia	spp.	deleted	8.0	9.0
8024	Osmoxylon	Osmoxylon	spp.	deleted	8.0	9.0
8056	ongor	Pandanus	compressus	deleted	8.0	9.0
8057	silaue	Pandanus	cylindricus	deleted	8.0	9.0
8058	kienpel	Pandanus	dilatatus	deleted	8.0	9.0
8059	ongor	Pandanus	divergens	deleted	8.0	9.0
8061	ongor	Pandanus	duriocarpus	deleted	8.0	9.0
8062	moak	Pandanus	enchabiensis	deleted	8.0	9.0
8063	hara	Pandanus	fischerianus	deleted	8.0	9.0
8065	nenketak	Pandanus	hosinoi	deleted	8.0	9.0
8066	pacheren	Pandanus	jaluitensis	deleted	8.0	9.0

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8068	siu	Pandanus	korrensis	deleted	8.0	9.0
8069	lakatwa	Pandanus	lakatwa	deleted	8.0	9.0
8070	erwan, jonmouia	Pandanus	laticanaliculatus	deleted	8.0	9.0
8071	intekul, pasyure	Pandanus	macrocephalus	deleted	8.0	9.0
8073	menne	Pandanus	menne	deleted	8.0	9.0
8075	Pandanus odontoides	Pandanus	odontoides	deleted	8.0	9.0
8079	alwan, kipal, taip	Pandanus	ponapensis	deleted	8.0	9.0
8080	deipw, jomineia	Pandanus	pulposus	deleted	8.0	9.0
8081	pathaplip	Pandanus	rectangulatus	deleted	8.0	9.0
8083	magojokojok	Pandanus	rotundatus	deleted	8.0	9.0
8086	kiparenwel	Pandanus	tolotomensis	deleted	8.0	9.0
8087	mojel	Pandanus	trukensis	deleted	8.0	9.0
8090	berrakelongor	Pandanus	variegatus	deleted	8.0	9.0
8092	lonlin, lajokorer	Pandanus	obliquus	deleted	8.0	9.0
8105	Parinari	Parinari	spp.	deleted	8.0	9.0
8153	date palm	Phoenix	spp.	deleted	8.0	9.0
8156	Fraser's photinia	Photinia	x fraseri	deleted	8.0	9.0
8180	Pimenta	Pimenta	spp.	deleted	8.0	9.0
8193	Guyanese pepper	Piper	glabrescens	deleted	8.0	9.0
8194	Jamaican pepper	Piper	hispidum	deleted	8.0	9.0
8195	Caracas pepper	Piper	jacquemontianum	deleted	8.0	9.0
8207	pipturus	Pipturus	spp.	deleted	8.0	9.0
8210	piscidia	Piscidia	spp.	deleted	8.0	9.0
8215	catchbirdtree	Pisonia	spp.	deleted	8.0	9.0
8246	mamalava	Planchonella	samoensis	deleted	8.0	9.0
8247	Planchonella	Planchonella	spp.	deleted	8.0	9.0
8252	platydesma	Platydesma	spp.	deleted	8.0	9.0
8263	hala pepe	Pleomele	spp.	deleted	8.0	9.0
8269	Plumeria obtusa	Plumeria	obtusa	corrected species name spelling	8.0	9.0
8272	Plumeria	Plumeria	spp.	deleted	8.0	9.0
8276	Poitea punicea	Poitea	punicea	deleted	8.0	9.0
8284	panax,geranium aralia	Polyscias	guilfoylei	change to common name	8.0	9.0
8294	Ponapea	Ponapea	spp.	deleted	8.0	9.0
8306	pouteria	Pouteria	spp.	deleted	8.0	9.0
8310	Premna	Premna	spp.	deleted	8.0	9.0
8341	fua lole	Procris	pedunculata	deleted	8.0	9.0
8394	thicket wild coffee	Psychotria	microdon	deleted	8.0	9.0
8403	common hoptree	Ptelea	trifoliata	deleted	8.0	9.0
8406	pteralyxia	Pteralyxia	spp.	deleted	8.0	9.0
8418	Ptychosperma	Ptychosperma	spp.	deleted	8.0	9.0
8420	pear	Pyrus	Spp.	species name capitalized	8.0	9.0
8435	devils-pepper	Rauvolfia	spp.	deleted	8.0	9.0
8443	reynoldsia	Reynoldsia	spp.	deleted	8.0	9.0
8453	pungent oak	Quercus	pungens	deleted	8.0	9.0
8457	Toumey oak	Quercus	toumeyi	deleted	8.0	9.0

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8459	Sonoran scrub oak	Quercus	turbinella	deleted	8.0	9.0
8463	mangrove	Rhizophora	spp.	deleted	8.0	9.0
8465	rose myrtle	Rhodomyrtus	spp.	deleted	8.0	9.0
8468	sumac	Rhus	spp.	deleted	8.0	9.0
8473	ricinus	Ricinus	spp.	deleted	8.0	9.0
8475	winged sumac	Rhus	copallinum	deleted	8.0	9.0
8477	smooth sumac	Rhus	glabra	deleted	8.0	9.0
8486	bristly locust	Robinia	hispida	deleted	8.0	9.0
8490	Roystonea elata	Roystonea	elata	new species name	8.0	9.0
8502	pussy willow	Salix	discolor	deleted	8.0	9.0
8506	raintree	Samanea	spp.	deleted	8.0	9.0
8507	Sitka willow	Salix	sitchensis	deleted	8.0	9.0
8508	Goodding's willow	Salix	gooddingii	deleted	8.0	9.0
8509	common elderberry	Sambucus	nigra	deleted	8.0	9.0
8510	raintree	Sambucus	spp.	deleted	8.0	9.0
8513	Buckley oak	Quercus	buckleyi	change in common name	8.0	9.0
8519	yellow willow	Salix	lutea	deleted	8.0	9.0
8523	diamondleaf willow	Salix	planifolia	deleted	8.0	9.0
8526	sandalwood	Santalum	spp.	deleted	8.0	9.0
8527	European black elderberry	Sambucus	nigra ssp nigra	deleted	8.0	9.0
8531	soapberry	Sapindus	spp.	deleted	8.0	9.0
8534	maskerekur	Sapium	indicum	deleted	8.0	9.0
8555	schaefferia	Schaefferia	spp.	deleted	8.0	9.0
8607	riverhemp	Sesbania	spp.	deleted	8.0	9.0
8609	yellow llima	Sida	fallax	deleted	8.0	9.0
8610	fanpetals	Sida	spp.	deleted	8.0	9.0
8621	Bully tree	Sideroxylon	persimile	added	-	9.0
8635	nightshade	Solanum	spp.	deleted	8.0	9.0
8642	necklacepod	Sophora	spp.	deleted	8.0	9.0
8645	spathodea	Spathodea	spp.	deleted	8.0	9.0
8651	Anacahuita, Texas olive	Cordia	boissieri	new common name	8.0	9.0
8653	Spondias	Spondias	spp.	deleted	8.0	9.0
8658	Greene's mountain ash	Sorbus	scopulina	deleted	8.0	9.0
8659	western mountain ash	Sorbus	sitchensis	deleted	8.0	9.0
8671	streblus	Streblus	spp.	deleted	8.0	9.0
8690	turpentine tree	Syncarpia	spp.	deleted	8.0	9.0
8718	trumpet-tree	Tabebuia	spp.	deleted	8.0	9.0
8727	Athel tamarisk	Tamarix	aphylla	deleted	8.0	9.0
8728	five-stamen tamarisk	Tamarix	chinensis	deleted	8.0	9.0
8729	saltcedar	Tamarix	ramosissima	deleted	8.0	9.0
8745	tectona	Tectona	spp.	deleted	8.0	9.0
8775	tetraplasandra	Tetraplasandra	spp.	deleted	8.0	9.0
8788	thespesia	Thespesia	spp.	deleted	8.0	9.0
8804	glorytree	Tibouchina	spp.	deleted	8.0	9.0

FIA Code	Common Name	Genus	Species	Kind of Change	Last field guide before change	Field guide in which change was made
8805	princess-flower	Tibouchina	urvilleana	deleted	8.0	9.0
8822	olona	Touchardia	latifolia	deleted	8.0	9.0
8823	touchardia	Touchardia	spp.	deleted	8.0	9.0
8826	soldierbush	Tournefortia	spp.	deleted	8.0	9.0
8830	poison sumac	Toxicodendron	vernix	deleted	8.0	9.0
8832	trema	Trema	spp.	deleted	8.0	9.0
8849	Trukia carolinensis	Trukia	carolinensis	corrected genus spelling	8.0	9.0
8858	urera	Urera	spp.	deleted	8.0	9.0
8870	vernicia	Vernicia	spp.	deleted	8.0	9.0
8875	chastetree	Vitex	spp.	deleted	8.0	9.0
8877	nannyberry	Viburnum	lentago	deleted	8.0	9.0
8878	blackhaw	Viburnum	prunifolium	deleted	8.0	9.0
8879	rusty blackhaw	Viburnum	rufidulum	deleted	8.0	9.0
8884	ateate	Wedelia	biflora	deleted	8.0	9.0
8905	Xylocarpus	Xylocarpus	spp.	deleted	8.0	9.0
8915	xylosma	Xylosma	spp.	deleted	8.0	9.0
8936	pricklyash	Zanthoxylum	spp.	deleted	8.0	9.0
8942	common pricklyash	Zanthoxylum	americanum	deleted	8.0	9.0
8944	Hercules' club	Zanthoxylum	clava-herculis	deleted	8.0	9.0
8947	common jujube	Ziziphus	zizyphus	deleted	8.0	9.0