The Forest Inventory and Analysis Database: Database Description and User Guide Version 6.0 for Phase 2

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Abstract:
This document is based on previous documentation of the nationally standardized Forest Inventory and Analysis database (Hansen and others 1992; Woudenberg and Farrenkopf 1995; Miles and others 2001; Woudenberg and others 2010). Documentation of the structure of the Forest Inventory and Analysis database (FIADB) for Phase 2 data, as well as codes and definitions, is provided. Examples for producing population-level estimates are also presented. This database provides a consistent framework for storing forest inventory data across all ownerships for the entire United States. These data are available to the public.

Keywords - Forest Inventory and Analysis, inventory database, user manual, user guide, monitoring

Preface

The Forest Inventory and Analysis (FIA) research program has been in existence since mandated by Congress in 1928. FIA's primary objective is to determine the extent, condition, volume, growth, and use of trees on the Nation's forest land. Before 1999, all inventories were conducted on a periodic basis. The passage of the 1998 Farm Bill requires FIA to collect data annually on plots within each State. This kind of up-to-date information is essential to frame realistic forest policies and programs. USDA Forest Service regional research stations are responsible for conducting these inventories and publishing summary reports for individual States.

In addition to published reports, the Forest Service provides data collected in each inventory to those interested in further analysis. This report describes a standard format in which data can be obtained. This standard format, referred to as the Forest Inventory and Analysis Database (FIADB) structure, was developed to provide users with as much data as possible in a consistent manner among States. A number of inventories conducted prior to the implementation of the annual inventory are available in the FIADB. However, various data attributes may be empty or the items may have been collected or computed differently. Annual inventories use a common plot design and common data collection procedures nationwide, resulting in greater consistency among FIA work units than earlier inventories. Data field definitions note inconsistencies caused by different sampling designs and processing methods.

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Chapter 1 -- Introduction

Purpose of This Guide

This guide is the definitive guide to the Forest Inventory and Analysis database (FIADB). This document replaces the previous FIADB users manual numbered 5.1.6, and General Technical Report RMRS-245, which covered version 4.0 of the FIADB. Although it is used widely within the Forest Inventory and Analysis (FIA) program, a substantial part, if not the majority, of the intended audience includes those outside FIA who are interested in using FIA data for their own analyses. Awareness of the potential uses of FIA data by users outside the FIA community is growing, and the data become increasingly useful as additional attributes are collected. However, as is the case with any data source, it is incumbent upon the user to understand not only the data definitions and acquisition methods, but also the context in which the data were collected. This guide is intended to help current and potential users understand the necessary details of the FIADB.

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

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

attribute in the REF_FOREST_TYPE table, while REF_UNIT.VALUE refers to the VALUE attribute in the REF_UNIT table.

The FIA Program

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

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

Starting in 1929, FIA accomplished its mission by conducting periodic forest inventories on a State-by-State basis. With the completion of Arizona, New Mexico, and Nevada in 1962, all 48 coterminous States had at least one periodic inventory (Van Hooser and others 1993). Repeat intervals for inventorying individual States have varied widely. By the late 1990s, most States had been inventoried more than once under the periodic inventory system; however, not all periodic data are available in electronic form (appendix L lists all periodic data available in the FIADB and the year in which annual inventory began).

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

Periodic and annual data are analyzed to produce reports at State, regional, and national levels. In addition to published reports, data are made available to the public for those who are interested in conducting their own analyses. Downloadable data, available online at http://fia.fs.fed.us/tools-data/, follow the format described in this document. Also available at this site are tools to make population estimates. The web-based EVALIDator tool or the Forest Inventory Data Online (FIDO) tool provides interactive access to the FIADB.

The FIA Database

The Forest Inventory and Analysis Database (FIADB) was developed to provide users with data in a consistent format, spanning all States and inventories. The first version of FIADB replaced two FIA regional databases; the Eastern States (Eastwide database) documented by Hansen and others (1992), and Western States (Westwide database) documented by Woudenberg and Farrenkopf (1995). A new national plot design (see chapter 2) provided the impetus for replacing these two databases, and FIA work units adopted the new design in all State inventories initiated after 1998. The FIADB table structure is currently derived from the National Information Management System (NIMS), which was designed to process and store annual inventory data. This is the sixth version of the single national FIA database to be released. A number of changes in the FIADB structure have been made to accommodate the data processing and storage requirements of NIMS. As a result, data from periodic inventories are stored in a format consistent with annual inventory data.

FIADB files are available for periodic inventory data collected as early as 1968 (see appendix L). A wide variety of plot designs and regionally defined attributes were used in periodic inventories, often differing by State. Because of this, some data attributes may not be populated or certain data may have been collected or computed differently. During some periodic inventories, ground plot data were collected on timberland only. FIA defines timberland as nonreserved forest land capable of producing at least 20 cubic feet of wood volume per acre per year (definition of forestland is in the COND_STATUS_CD description in the COND table.) Thus, low productivity forest land, reserved (areas reserved from timber harvesting), and nonforested areas usually were not ground sampled. To account for the total area of a State, “place holder” plots were created to represent these nonsampled areas, which are identified by plot design code 999 in FIADB (PLOT.DESIGNCD = 999). For these plots, many attributes that are normally populated for forested plots will be blank. Users should be aware that while place holder plots account for the area of nonsampled forest land, they do not account for the corresponding forest attributes (such as volume, growth, or mortality) that may exist in those areas.

Annual inventories, initiated sometime after 1999 depending on the State, use a nationally standardized plot design and common data collection procedures resulting in greater consistency among FIA work units than earlier inventories. However, as part of a continuing effort to improve

the inventory, some changes in methodology and attribute definitions have been implemented after the new design was put into practice. Beginning in 1998, FIA started using a National Field Guide referenced as Field Guide 1.0. The database contains an attribute labeled MANUAL that stores the version number of the field guide under which the data were collected. When both the plot design is coded as being the national design (PLOT.DESIGNCD = 1) and the field guide is coded with a number greater than or equal to 1, certain attributes are defined as being "core" while others are allowed to be "core optional." Core attributes must be collected by every FIA work unit, using the same definition and set of codes. In contrast, collection of core optional attributes are decided upon by individual FIA work units, using the same national protocol, predefined definition, and set of codes. Many attributes, regardless of whether or not they are core or core optional, are only populated for forested conditions, and are blank for other conditions (such as nonforest or water). Attributes described in chapter 3 are noted if they are core optional.

Users who wish to analyze data using aggregations of multiple State inventories or multiple inventories within States should become familiar with changes in methodology and attribute definitions (see chapters 2 and 3). For each attribute in the current version of FIADB, an effort has been made to provide the current definition of the attribute, as well as any variations in definition that may have been used among various FIA work units. In other words, although inventory data have been made available in a common data format, users should be aware of differences that might affect their analyses.

Changes From the Previous Database Version

Database users should also be aware that changes are made for each version of FIADB. Sometimes the changes are minimal, such as simply rewriting explanatory text for clarification or adding new codes to a particular attribute. Database tables and/or attributes may be added or removed. In this release (6.0), tables 1-3 summarize major modifications to FIADB 5.1.6.

Table 1. Database table attribute additions in FIADB 6.0

Name of table affected	Name of column added to table
COND	CHAINING_CD
COND	LAND_COVER_CLASS_CD
COND	AFFORESTATION_CD
COND	PREV_AFFORESTATION_CD

Table 2. Database table attributes name changes in FIADB 6.0

Name of table affected	Old attribute name	New attribute name
COND	RESERVCD_FLD	RESERVCD_5

Table 3. Database table attributes with updates to the attribute description text in FIADB 6.0

Name of table affected	Name of column with updated text
PLOT	NF_PLOT_STATUS_CD
PLOT	P2VEG_SAMPLING_STAUS_CD
PLOT	P2VEG_SAMPLING_LEVEL_DETAIL_CD
COND	COND_STATUS_CD
COND	OWNCD

Name of table affected	Name of column with updated text
COND	FLDSZCD
COND	GSSTKCD
COND	ALSTKCD
COND	PRESNFCD
COND	LIVE_MISSING_CANOPY_CVR_PCT
COND	OWNSUBCD
COND	INDUSTRIALCD_FIADB
COND	RESERVCD_FLD
COND	ADMIN_WITHDRAWN_CD
SUBPLOT	P2VEG_SUBP_STATUS_CD
TREE	VOLCSNET
TREE	VOLBFNET
TREE	DAMAGE_AGENT_CD1
TREE	DAMAGE_AGENT_CD2
TREE	DAMAGE_AGENT_CD3
P2VEG_SUBPLOT_SPP	VEG_FLDSPCD
P2VEG_SUBPLOT_SPP	GROWH_HABIT_CD
REF_POP_ATTRIBUTE	EXPRESSION
REF_POP_EVAL_TYP_DESCR	EVAL_TYP
REF_INVASIVE_SPECIES	MANUAL_START
REF_INVASIVE_SPECIES	MANUAL_END

Other changes in the user guide text are:

- Changed the definition of Accessible Forest Land, see COND.COND_STATUS_CD
- Updated some text in the Preface
- Updated table 20 (now table 4). Contacts at individual FIA work units
- Added some examples to the section in chapter 2 called Expansion Factors
- In the PLOT table, attribute 45 INTENSITY. Changed the oracle data type from VARCHAR2(2) to VARCHAR2(3)
- Added a foreign key to the PLOTGEOM table
- In chapter 4, section 3 *Linking the appropriate tables in FIADB to produce estimates of attribute of interest for a population*. Added a new common alias for FIADB tables
- In chapter 4, added several new subsections to section *7 Estimates of change over time on the standard 4-subplot fixed-area plot*

- The appendices were rearranged as follows:

Old Appendix Letter and Name	New Appendix Letter and Name	Old Appendix Letter
Appendix A. Index of Column Names	Appendix A. Index of Column Names	A
Appendix B. Forest Inventory and Analysis (FIA) Plot Design Codes and Definitions by FIA Work Unit	Appendix B. State, Survey Unit, and County Codes	C
Appendix C. State, Survey Unit, and County Codes	Appendix C. Administrative National Forest Codes and Names	E
Appendix D. Forest Type Codes and Names	Appendix D. Forest Type Codes and Names	D
Appendix E. Administrative National Forest Codes and Names	Appendix E. Tree Species Group Codes	G
Appendix F. Tree Species Codes, Names, and Occurrences	Appendix F. Tree Species Codes, Names, and Occurrences	F
Appendix G. Tree Species Group Codes	Appendix G. Caribbean Tree Species Codes, Names, and Occurrences	K
Appendix H. Damage Agent Codes for PNW	Appendix H. Pacific Tree Species Codes, Names, and Occurrences	L
Appendix I. FIA Inventories by State, Year, and Type	Appendix I. Forest Inventory and Analysis (FIA) Plot Design Codes and Definitions by FIA Work Unit	B
Appendix J. Biomass Estimation in the FIADB	Appendix J. Damage	none (new)
Appendix K. Caribbean Tree Species Codes, Names, and Occurrences	Appendix K. Damage Agent Codes for PNW	H
Appendix L. Pacific Tree Species Codes, Names, and Occurrences	Appendix L. FIA Inventories by State, Year, and Type	I
Appendix M. Damage Codes	Appendix M. Biomass Estimation in the FIADB	J
none (new)	Appendix N. Reserved and Administratively Withdrawn Status by Owner and Land Designation	none (new)

- In appendix I, added three new plot designs and descriptions

- In appendix B, added information for six new locations: American Samoa, Federated States of Micronesia, Guam, Marshall Islands, Northern Mariana Islands, and Palau

Chapter 2 -- FIA Sampling and Estimation Procedures

To use the FIADB effectively, users should acquire a basic understanding of FIA sampling and estimation procedures. Generally described, FIA uses what may be characterized as a three-phase sampling scheme. Phase 1 (P1) is used for stratification, while Phase 2 (P2) consists of plots that are visited or photo-interpreted. A subset of Phase 2 plots are designated as Phase 3 (P3) plots (formerly known as Forest Health Monitoring [FHM] plots) where additional health indicator attributes are collected. Phases 1 and 2 are described in this chapter, but Phase 3 is described in a separate user guide (U.S. Forest Service 2011, online). The exception is P3 crown attributes, which are described in the TREE table of this document.

Sampling and Stratification Methodology

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

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

Selection criteria for remote sensing classes and computation of area expansion factors differ from State to State. Users interested in the details of how these expansion factors are assigned to ground plots for a particular State should contact the appropriate FIA work unit (see table 4).

Ground Sampling (P2)
FIA ground plots, or Phase 2 plots, are designed to cover a 1-acre sample area; however, not all trees on the acre are measured. Ground plots may be new plots that have never been measured, or re-measurement plots that were measured during one or more previous inventories. Recent inventories use a nationally standard, fixed-radius plot layout for sample tree selection (see figure 2). Various arrangements of fixed-radius and variable-radius (prism) subplots were used to select sample trees in older inventories.

Plot Location

The FIADB includes coordinates for every plot location in the database, whether it is forested or not, but these are not the precise locations of the plot centers. In an amendment to the Food Security Act of 1985 (reference 7 USC 2276 § 1770), Congress directed FIA to ensure the privacy of private landowners. Exact plot coordinates could be used in conjunction with other publicly available data

to link plot data to specific landowners, in violation of requirements set by Congress. In addition to the issue of private landowner privacy, the FIA program had concerns about plot integrity and vandalism of plot locations on public lands. A revised policy has been implemented and methods for making approximate coordinates available for all plots have been developed. These methods are collectively known as "fuzzing and swapping" (Lister and others 2005).

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

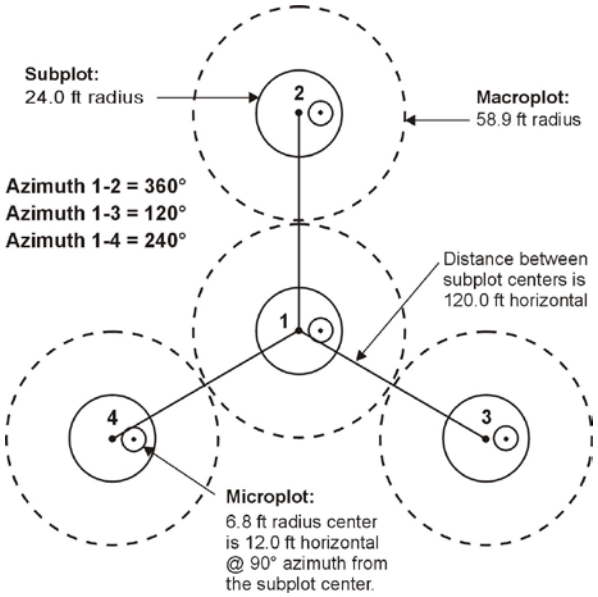


Figure 2. The FIA mapped plot design. Subplot 1 is the center of the cluster with subplots 2, 3, and 4 located 120 feet away at azimuths of 360°, 120°, and 240°, respectively.

For plot data collected under the current plot design, plot numbers are reassigned to sever the link to other coordinates stored in the FIADB prior to the change in the law. Private plots are also swapped using the method described above; remeasured plots are swapped independent of the periodic data. All plot coordinates are fuzzed, but less than before – within 0.5 mile for most plots and up to 1.0

mile on a small subset of them. This was done to make it difficult to locate the plot on the ground, while maintaining a good correlation between the plot data and map-based characteristics.

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

Plot Design, Condition Delineation, and Types of Data Attributes

Plot Designs

The current national standard FIA plot design was originally developed for the Forest Health Monitoring program (Scott and others 1993). It was adopted by FIA in the mid-1990s and used for the last few periodic inventories and all annual inventories. The standard plot consists of four 24.0-foot radius subplots (approximately 0.0415 or 1/24 acre) (see figure 2), on which trees 5.0 inches and greater in diameter are measured. Within each of these subplots is nested a 6.8-foot radius microplot (approximately 1/300th acre) on which trees smaller than 5.0 inches in diameter are measured. A core optional variant of the standard design includes four "macroplots," each with a radius of 58.9 feet (approximately 1/4 acre) that originate at the centers of the 24.0-foot radius subplots. Breakpoint diameters between the 24-foot radius subplots and the macroplots vary and are specified in the macroplot breakpoint diameter attribute (PLOT.MACRO_BREAKPOINT_DIA).

Prior to adoption of the current plot design, a wide variety of plot designs were used. Periodic inventories might include a mixture of designs, based on forest type, ownership, or time of plot measurement. In addition, similar plot designs (e.g., 20 BAF variable-radius plots) might have been used with different minimum diameter specifications (e.g., 1-inch versus 5-inch). Details on these designs are included in appendix I (plot design codes).

Conditions

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

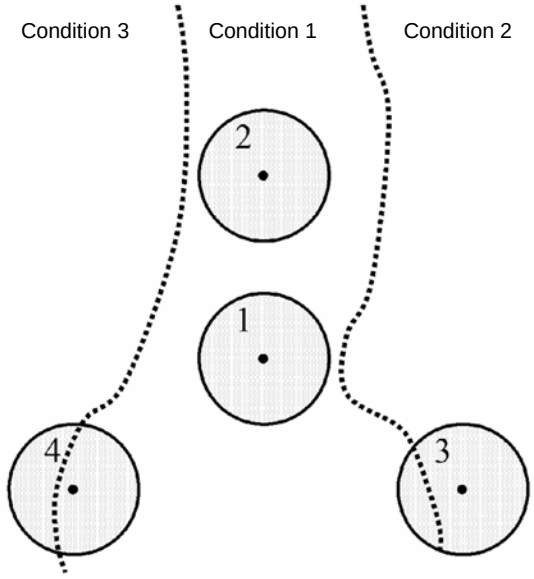


Figure 3. The FIA mapped plot design. Subplot 1 is the center of the cluster with subplots 2, 3, and 4 located 120 feet away at azimuths of 360°, 120°, and 240°, respectively. When a plot straddles two or more conditions, the plot area is divided by condition.

Types of Attributes

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

For measured attributes, this document provides only basic information on the methodology used in the field. The authoritative source for methodology is the Forest Inventory and Analysis National Core Field Guide used during the inventory in which the data were collected (see http://www.fia.fs.fed.us/library/field-guides-methods-proc/). The MANUAL attribute in the PLOT table documents the version number where data collection protocols can be found.

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

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

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

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

Regional Attributes

A number of regionally specific attributes are available in FIADB. These regional attributes are identified by FIA work unit, both in the table structure description (e.g., the attribute is named with an extension such as NERS) and in the attribute description (e.g., the attribute description text contains the phrase "Only collected by…"). For specific questions about the data from a particular FIA work unit, please contact the individuals listed in table 4.

Table 4. Contacts at individual FIA work units

FIA Work Unit	RSCD	States	Database Contact	Phone	Analyst Contact	Phone
Rocky Mountain (RMRS)	22	AZ,CO,ID,MT,NV, NM,UT,WY	Mark Rubey	801-625-5647	John Shaw	801-625-5673
North Central (NCRS)*	23	IL,IN,IA,KS,MI,MN, MO,NE,ND,SD,WI	Mark Hatfield	651-649-5169	Scott Pugh	906-482-6303 x17
Northeastern (NERS)*	24	CT,DE,ME,MD,MA, NH,NJ,NY,OH,PA, RI, VT,WV	Mark Hatfield	651-649-5169	Randy Morin	610-557-4054
Pacific Northwest (PNWRS)	26,27	AK,CA,HI,OR,WA	Ron Wanek	503-808-2048	Karen Waddell	503-808-2046
Southern (SRS)	33	AL,AR,FL,GA,KY, LA,MS,NC,OK,SC, TN,TX,VA, PR, VI	Jeff Turner	865-862-2053	Tom Brandeis	865-862-2030

*The North Central Research Station (NCRS) and the Northeastern Research Station (NERS) have merged to become one research station, the Northern Research Station. The former regional designations are kept to accommodate the data.

More information on attribute types is included in chapter 3.

Expansion Factors

Tree Expansion Factors
The expansion factor(s) used to scale each tree on a plot to a per-acre basis is dependent on the plot design. The examples here are for fixed-radius plots (see appendix I for all plot designs.) For fixed-plot designs, scaling is straightforward, with the number of trees per acre (TPA) represented by one tree equal to the inverse of the plot area in acres. The general formula is shown by equation [1]:

[1] $TPA = 1/(N*A)$

Where N is the number of subplots, and
A is the area of each subplot.

For example, the TPA expansion factor of each tree ≥5.0 inches in diameter occurring on the current plot design would be calculated using equation [2.1]:

TPA expansion factors for standard subplot, microplot and macroplot designs

[2.1] TPA per 24-foot fixed-radius subplot

Radius of a subplot = 24 feet
Area of subplot = $pi*radius^2$
Area of subplot = $3.141592654*24^2$
Area of subplot = 1809.557368 square feet

Acres in a subplot = area of subplot in square feet / (43560 square feet /acre)
Acres in a subplot = 1809.557368 square feet / (43560 square feet /acre)
Acres in a subplot = 0.04154172 acres per subplot
Acres in a plot = 4 subplots per plot
Acres per plot = 4* 0.04154172
= 0.166166884 acres per plot

TPA = 1 / (0.166166884) = 6.018046

The TPA expansion factor of each sapling 1.0 to 5.0 inches in diameter occurring on the current microplot design would be calculated using equation [2.2]:

[2.2] TPA per 6.8-foot fixed-radius microplot

Radius of a microplot = 6.8 feet
Area of microplot = $pi*radius^2$
Area of microplot = $3.141592654*6.8^2$
Area of microplot = 145.2672443 square feet

Acres in a microplot = area of microplot in square feet / (43560 square feet /acre)
Acres in a microplot = 145.2672443 square feet / (43560 square feet /acre)
Acres in a microplot = 0.003334877 acres per subplot

Acres in a plot = 4 microplots per plot
Acres per plot = 4* 0.003334877
= 0.013339508 acres per plot

TPA = 1 / (0.013339508) = 74.965282

The TPA expansion factor of each tree ≥5.0 inches in diameter occurring on the current macroplot design would be calculated using equation [2.3]:

[2.3] TPA per 58.9-foot fixed-radius macroplot

Radius of a macroplot = 58.9 feet
Area of macroplot = pi*radius^2
Area of macroplot = 3.141592654*58.9^2
Area of macroplot = 10898.84465 square feet

Acres in a macroplot = area of macroplot in square feet / (43560 square feet /acre)
Acres in a macroplot = 10898.84465 square feet / (43560 square feet /acre)
Acres in a macroplot = 0.250203045 acres per subplot
Acres in a plot = 4 macroplots per plot
Acres per plot = 4* 0.250203045
= 1.000812181 acres per plot

TPA = 1 / (1.000812181) = 0.999188

This expansion factor can be found in the TPA_UNADJ attribute in the TREE table (see chapter 3) for plots measured with the annual plot design.

In variable-radius plot designs, the per-acre expansion factor is determined by the diameter of the tree, the basal area factor (BAF), and the number of points used in the plot design. The general formula is shown by equation [3]:

[3] TPA = (BAF / 0.005454*DIA^2)/N
Where BAF is the variable-radius basal area factor in square feet,
DIA is diameter of the tally tree in inches, and
N is the number of points in the plot design.

For example, if an 11.5-inch tree is tallied using a 10 BAF prism on a variable-radius design plot that uses five points, the calculation is:

[4] TPA = (10 / 0.005454*11.5^2)/5 = 2.773

A 5.2-inch tree will have a greater expansion factor:

[5] TPA = (10 / 0.005454*5.2^2)/5 = 13.562

Although it is not necessary to calculate expansion factors for different plot designs because they are stored in TPA_UNADJ, information on plot design can be found by using the code from the DESIGNCD attribute in the PLOT table to look up the plot design specifications in appendix I.

Plot Area Expansion Factors

Some previous versions of FIADB have included area expansion factors in the PLOT table that were used to scale plot-level data to population-level estimates (see EXPCURR and related attributes in Miles and others 2001). In this version of FIADB, area expansion factors have been removed from the PLOT table. Instead, there is one area expansion factor (EXPNS) stored in the POP_STRATUM table. This change is needed because of the way annual inventory data are compiled. Under the annual inventory system, new plots are added each year. Adjustment factors that are used to compensate for denied access, inaccessible, and other reasons for not sampling may differ each time new data replaces older data. Both the number of acres each plot represents and the adjustments for the proportion of plots not sampled may change each year. In order to allow users to obtain population estimates for any grouping of data, an adjustment factor has been calculated and stored for each set of data being compiled. There is a separate adjustment factor for each fixed plot size: microplot, subplot, and macroplot. These attributes are also stored in the POP_STRATUM table. Each time the data are stratified differently, the adjustments and expansion factor may change. Therefore, FIA provides a different expansion factor every time the data are restratified.

FIA has chosen the term ‘evaluation’ to describe this process of storing different stratifications of data either for an individual set of data or for the changing sets of data through time. Each aggregation of data is given an evaluation identifier (EVALID). The user can select population estimates for the most current set of data or for previous sets of data. In addition to being able to calculate population estimates, users can now calculate sampling error information because FIA is storing all of the Phase 1 information used for the stratification. That information is stored for each estimation unit, which is usually a geographic subset of the State (see the POP_ESTN_UNIT table). For more information about evaluations and calculation of area expansion factors, see chapter 4.

Accuracy Standards

Forest inventory plans are designed to meet sampling error standards for area, volume, growth, and removals provided in the Forest Service directive (FSH 4809.11) known as the Forest Survey Handbook (U.S. Department of Agriculture 2008). These standards, along with other guidelines, are aimed at obtaining comprehensive and comparable information on timber resources for all parts of the country. FIA inventories are commonly designed to meet the specified sampling errors at the State level at the 67 percent confidence limit (one standard error). The Forest Survey Handbook mandates that the sampling error for area cannot exceed 3 percent error per 1 million acres of timberland. A 5 percent (Eastern United States) or 10 percent (Western United States) error per 1 billion cubic feet of growing-stock trees on timberland is applied to volume, removals, and net annual growth. Unlike the mandated sampling error for area, sampling errors for volume, removals, and growth are only targets.

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

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

The greater allowance for sampling error in smaller areas reflects the decrease in sample size as estimation area decreases.

Estimation procedures and the calculation of confidence intervals for typical FIA tables are discussed in chapter 4. Additional information on estimation and confidence intervals can be found in Bechtold and Patterson (2005).

Chapter 3 -- Database Structure

This chapter provides information about the database tables, including detailed descriptions of all attributes within the tables. Each column or attribute in a table is listed with its unabbreviated name, followed by a description of the attribute. Attributes that are coded include a list of the codes and their meanings. Appendix A is an index of the attributes, sorted alphabetically by column name, showing the table where the column is found including the attribute number in the table. Some overview information is presented below, followed by a section with complete information about all tables and attributes.

Table Descriptions

There are 34 data tables and 14 reference tables in the phase 1 and phase 2 portions of the FIA Database.

- SURVEY table – Contains one record for each year an inventory is conducted in a State for annual inventory or one record for each periodic inventory.
  - SURVEY.CN = PLOT.SRV_CN links the unique inventory record for a State and year to the plot records.
- COUNTY table – Reference table for the county codes and names. This table also includes survey unit codes.
  - COUNTY.CN = PLOT.CTY_CN links the unique county record to the plot record.
- PLOT table – Provides information relevant to the entire 1-acre field plot. This table links to most other tables, and the linkage is made using PLOT.CN = *TABLE_NAME*.PLT_CN (*TABLE_NAME* is the name of any table containing the column name PLT_CN). Below are some examples of linking PLOT to other tables.
  - PLOT.CN = COND.PLT_CN links the unique plot record to the condition class record(s).
  - PLOT.CN = SUBPLOT.PLT_CN links the unique plot record to the subplot records.
  - PLOT.CN = TREE.PLT_CN links the unique plot record to the tree records.
  - PLOT.CN = SEEDLING.PLT_CN links the unique plot record to the seedling records.
- COND table – Provides information on the discrete combination of landscape attributes that define the condition (a condition will have the same land class, reserved status, owner group, forest type, stand-size class, regeneration status, and stand density).
  - PLOT.CN = COND.PLT_CN links the condition class record (s) to the plot table.
  - COND.PLT_CN = SITETREE.PLT_CN and COND.CONDID = SITETREE.CONDID links the condition class record to the site tree data.
  - COND.PLT_CN = TREE.PLT_CN and COND.CONDID = TREE.CONDID links the condition class record to the tree data.
- SUBPLOT table – Describes the features of a single subplot. There are multiple subplots per 1-acre field plot and there can be multiple conditions sampled on each subplot.
  - PLOT.CN = SUBPLOT.PLT_CN links the unique plot record to the subplot records.
  - SUBPLOT.PLT_CN = COND.PLT_CN and SUBPLOT.MACRCOND = COND.CONDID links the macroplot conditions to the condition class record.
  - SUBPLOT.PLT_CN = COND.PLT_CN and SUBPLOT.SUBPCOND = COND.CONDID links the subplot conditions to the condition class record.

  - SUBPLOT.PLT_CN = COND.PLT_CN and SUBPLOT.MICRCOND = COND.CONDID links the microplot conditions to the condition class record.
- SUBP_COND table – Contains information about the proportion of a subplot in a condition.
  - PLOT.CN = SUBP_COND.PLT_CN links the subplot condition class record to the plot table.
  - SUBP_COND.PLT_CN = COND.PLT_CN and SUBP_COND.CONDID = COND.CONDID links the condition class records found on the four subplots to the subplot description.
- BOUNDARY table – Provides a description of the demarcation line between two conditions that occur on a single subplot.
  - PLOT.CN = BOUNDARY.PLT_CN links the boundary records to the unique plot record.
- SUBP_COND_CHNG_MTRX table – Contains information about the mix of current and previous conditions that occupy the same area on the subplot.
  - PLOT.CN = SUBP_COND_CHNG_MTRX.PLT_CN links the subplot condition change matrix records to the unique plot record.
  - PLOT.PREV_PLT_CN = SUBP_COND_CHNG_MTRX.PREV_PLT_CN links the subplot condition change matrix records to the unique previous plot record.
- TREE table – Provides information for each tree 1 inch in diameter and larger found on a microplot, subplot, or core optional macroplot.
  - PLOT.CN = TREE.PLT_CN links the tree records to the unique plot record.
  - COND.PLT_CN = TREE.PLT_CN and COND.CONDID = TREE.CONDID links the tree records to the unique condition record.
- TREE_GRM_ESTN table – Contains information used to produce estimates of growth, removals and mortality.
  - PLOT.CN = TREE_GRM_ESTN.PLT_CN links the tree GRM estimation records to the unique plot record.
  - TREE.CN = TREE_GRM_ESTN.TRE_CN links the tree GRM estimation records to the unique tree record.
- TREE_REGIONAL_BIOMASS table – Contains biomass estimates computed using equations and methodology that varies by FIA work unit. This table retains valuable information for generating biomass estimates that match earlier published reports.
  - TREE.CN = TREE_REGIONAL_BIOMASS.TRE_CN links a tree regional biomass record to the corresponding unique tree.
- SEEDLING table – Provides a count of the number of live trees of a species found on a microplot that are less than 1 inch in diameter but at least 6 inches in length for conifer species or at least 12 inches in length for hardwood species.
  - PLOT.CN = SEEDLING.PLT_CN links the seedling records to the unique plot record.
- SITETREE table – Provides information on the site tree(s) collected in order to calculate site index and/or site productivity information for a condition.
  - PLOT.CN = SITETREE.PLT_CN links the site tree records to the unique plot record.
  - SITETREE.PLT_CN = COND.PLT_CN and SITETREE.CONDID = COND.CONDID links the site tree record(s)to the unique condition class record.
- INVASIVE_SUBPLOT_SPP table – Provides percent cover data of invasive species identified on the subplot.
  - PLOT.CN = INVASIVE_SUBPLOT_SPP.PLT_CN links the invasive subplot species record(s) to the unique plot record.

    - SUBP_COND.PLT_CN = INVASIVE_SUBPLOT_SPP.PLT_CN and SUBP_COND.CONDID = INVASIVE_SUBPLOT_SPP.CONDID and SUBP_COND.SUBP = INVASIVE_SUBPLOT_SPP.SUBP links the invasive subplot species record(s) to the unique subplot condition record.
    - INVASIVE_SUBPLOT_SPP.VEG_SPCD = REF_PLANT_DICTIONARY.SYMBOL links the invasive vegetation subplot NRCS species code to the plant dictionary reference species code.
- P2VEG_SUBPLOT_SPP table – Provides percent cover data of vegetation species identified on the subplot.
    - PLOT.CN = P2VEG_SUBPLOT_SPP.PLT_CN links the vegetation subplot species record(s) to the unique plot record.
    - SUBP_COND.PLT_CN = P2VEG_SUBPLOT_SPP.PLT_CN and SUBP_COND.CONDID = P2VEG_SUBPLOT_SPP.CONDID and SUBP_COND.SUBP = P2VEG_SUBPLOT_SPP.SUBP links the vegetation subplot species record(s) to the unique subplot condition record.
    - P2VEG_SUBPLOT_SPP.VEG_SPCD = REF_PLANT_DICTIONARY.SYMBOL links the P2 vegetation subplot NRCS species code to the plant dictionary reference species code.
- P2VEG_SUBP_STRUCTURE table – Provides percent cover by layer by growth habit.
    - PLOT.CN = P2VEG_SUBP_STRUCTURE. PLT_CN links the subplot structure record(s) to the unique plot record.
    - SUBP_COND.PLT_CN = P2VEG_SUBP_STRUCTURE.PLT_CN and SUBP_COND.CONDID = P2VEG_SUBP_STRUCTURE.CONDID and SUBP_COND.SUBP = P2VEG_SUBP_STRUCTURE.SUBP links the vegetation subplot structure record(s) to the unique subplot condition record.
- DWM_VISIT table – Provides general information on down woody material indicator visit, such as the date of the DWM survey.
    - PLOT.CN = DWM_VISIT.PLT_CN links the down woody material indicator visit record to the unique plot record.
- DWM_TRANSECT_SEGMENT table – Describes the down woody material transect segment lengths by condition class.
    - PLOT.CN = DWM_TRANSECT_SEGMENT.PLT_CN links the down woody material transect length records to the unique plot record.
    - COND.PLT_CN = DWM_TRANSECT_SEGMENT.PLT_CN and COND.CONDID = DWM_TRANSECT_SEGMENT.CONDID links the down woody material transect segment records to the unique condition record.
- DWM_COARSE_WOODY_DEBRIS table – Provides information for each piece of coarse woody debris measured along the transects.
    - PLOT.CN = DWM_COARSE_WOODY_DEBRIS.PLT_CN links the down woody material coarse woody debris records to the unique plot record.
    - COND.PLT_CN = DWM_COARSE_WOODY_DEBRIS.PLT_CN and COND.CONDID = DWM_COARSE_WOODY_DEBRIS.CONDID links the coarse woody debris records to the unique condition record.
- DWM_FINE_WOODY_DEBRIS table – Provides information on the fine woody debris measured along a segment of the transects.
    - PLOT.CN = DWM_FINE_WOODY_DEBRIS.PLT_CN links the fine woody debris records to the unique plot record.

    - COND.PLT_CN = DWM_FINE_WOODY_DEBRIS.PLT_CN and COND.CONDID = DWM_FINE_WOODY_DEBRIS.CONDID links the fine woody debris records to the unique condition record.
- DWM_DUFF_LITTER_FUEL table – Provides information on the duff, litter, fuelbed depths measured at a point on the transects.
    - PLOT.CN = DWM_DUFF_LITTER_FUEL.PLT_CN links the duff, litter, fuelbed records to the unique plot record.
    - COND.PLT_CN = DWM_DUFF_LITTER_FUEL.PLT_CN and COND.CONDID= DWM_DUFF_LITTER_FUEL.CONDID links the duff, litter, fuel records to the unique condition record.
- DWM_MICROPLOT_FUEL table – Provides information on the fuel loads (shrubs and herbs) measured on the microplot.
    - PLOT.CN = DWM_MICROPLOT_FUEL.PLT_CN links the microplot fuel records to the unique plot record.
- DWM_RESIDUAL_PILE table – Provides information on the wood piles measured on the subplot.
    - PLOT.CN = DWM_RESIDUAL_PILE.PLT_CN links the wood piles records to the unique plot record.
    - COND.PLT_CN = DWM_RESIDUAL_PILE.PLT_CN and COND.CONDID = DWM_RESIDUAL_PILE.CONDID links the wood piles records to the unique condition record.
- COND_DWM_CALC table – Contains calculations used to create estimations on the down woody material indicator.
    - PLOT.CN = COND_DWM_CALC.PLT_CN links the down woody material calculation records to the unique plot record.
    - COND.PLT_CN = COND_DWM_CALC.PLT_CN and COND.CONDID = COND_DWM_CALC.CONDID links the down woody material calculation records to the unique condition record.
    - POP_STRATUM. CN = COND_DWM_CALC.STRATUM_CN links the down woody material calculation records to the unique population stratum record.
- POP_ESTN_UNIT table – An estimation unit is a geographic area that can be drawn on a map. It has a known area, and the sampling intensity must be the same within a stratum within an estimation unit. Generally, estimation units are contiguous areas, but exceptions are made when certain ownerships, usually National Forests, are sampled at different intensities. One record in the POP_ESTN_UNIT table corresponds to a single estimation unit.
    - POP_ESTN_UNIT.CN = POP_STRATUM.ESTN_UNIT_CN links the unique stratified geographical area (ESTN_UNIT) to the strata (STRATUMCD) that are assigned to each ESTN_UNIT.
- POP_EVAL table – An evaluation is the combination of a set of plots (the sample) and a set of Phase 1 data (obtained through remote sensing, called a stratification) that can be used to produce population estimates for a State (an evaluation may be created to produce population estimates for a region other than a State, such as the Black Hills National Forest). A record in the POP_EVAL table identifies one evaluation and provides some descriptive information about how the evaluation may be used.
    - POP_ESTN_UNIT.EVAL_CN = POP_EVAL.CN links the unique evaluation identifier (EVALID) in the POP_EVAL table to the unique geographical areas (ESTN_UNIT) that

are stratified. Within a population evaluation (EVALID) there can be multiple population estimation units, or geographic areas across which there are a number of values being estimated (e.g., estimation of volume across counties for a given State).

- POP_EVAL_ATTRIBUTE table – Provides information as to which population estimates can be provided by an evaluation. If an evaluation can produce 22 of the 92 currently supported population estimates, there will be 22 records in the POP_EVAL_ATTRIBUTE table (one per population estimate) for that evaluation.
  - POP_EVAL.CN = POP_EVAL_ATTRIBUTE.EVAL_CN links the unique evaluation identifier to the list of population estimates that can be derived for that evaluation.
- POP_EVAL_GRP table – Lists and describes the evaluation groups. One record in the POP_EVAL_GRP table can be linked to all the evaluations that were used in generating estimates for a State inventory report.
  - POP_EVAL_GRP.CN = POP_EVAL_TYP.EVAL_GRP_CN links the evaluation group record to the evaluation type record.
- POP_EVAL_TYP table – Provides information on the type of evaluations that were used to generate a set of tables for an inventory report. In a typical State inventory report, one evaluation is used to generate an estimate of the total land area; a second evaluation is used to generate current estimates of volume, numbers of trees and biomass; and a third evaluation is used for estimating growth, removals and mortality.
  - POP_EVAL_TYP.EVAL_CN = POP_EVAL.CN links the evaluation type record to the evaluation record.
  - POP_EVAL_TYP.EVAL_GRP_CN = POP_EVAL_GRP.CN links the evaluation type record to the evaluation group record.
  - POP_EVAL_TYP.EVAL_TYP = REF_POP_EVAL_TYP_DESCR.EVAL_TYP links an evaluation type record to an evaluation type description reference record.
- POP_PLOT_STRATUM_ASSGN table – Stratum information is assigned to a plot by overlaying the plot's location on the Phase 1 imagery. Plots are linked to their appropriate stratum for an evaluation via the POP_PLOT_STRATUM_ASSGN table.
  - POP_PLOT_STRATUM_ASSGN.PLT_CN = PLOT.CN links the stratum assigned to the plot record.
- POP_STRATUM table – The area within an estimation unit is divided into strata. The area for each stratum can be calculated by determining the proportion of Phase 1 pixels/plots in each stratum and multiplying that proportion by the total area in the estimation unit. Information for a single stratum is stored in a single record of the POP_STRATUM table.
  - POP_STRATUM.CN = POP_PLOT_STRATUM_ASSGN.STRATUM_CN links the defined stratum to each plot.
- PLOTGEOM table – Contains geometric attributes associated with the plot location, such as the hydrological unit and roadless codes.
  - PLOTGEOM.CN = PLOT.CN links the unique plot record between the two tables.
- PLOTSNAP table – Combines the information in the PLOT table with information in the PLOT_EVAL_GRP and POP_STRATUM tables to provide a snapshot of the plot records with their associated expansion and adjustment factors.
  - PLOTSNAP.CN = PLOT.CN links the unique plot record between the two tables.
- REF_CITATION table – Identifies the published source for information on specific gravities, moisture content, and bark as a percent of wood volume that is provided in the REF_SPECIES table.

    - REF_SPECIES.WOOD_SPGR_GREENVOL_DRYWT_CIT = REF_CITATION.CITATION_NBR
    - REF_SPECIES.BARK_SPGR_GREENVOL_DRYWT_CIT = REF_CITATION.CITATION_NBR
    - REF_SPECIES.MC_PCT_GREEN_WOOD_CIT = REF_CITATION.CITATION_NBR
    - REF_SPECIES.MC_PCT_GREEN_BARK_CIT = REF_CITATION.CITATION_NBR
    - REF_SPECIES.WOOD_SPGR_MC12VOL_DRYWT_CIT = REF_CITATION.CITATION_NBR
    - REF_SPECIES.BARK_VOL_PCT_CIT = REF_CITATION.CITATION_NBR
- REF_FIADB_VERSION table – Contains information identifying the format of the currently available FIADB.
- REF_FOREST_TYPE table – A reference table containing forest type codes, descriptive names and other information. Data users should link codes as shown below and then obtain the information stored in MEANING to convert the code to a name.
    - REF_FOREST_TYPE.VALUE = COND.FORTYPCD links the forest type reference record to the condition forest code used for reporting and analysis purposes.
    - REF_FOREST_TYPE.VALUE = COND.FLDTYPCD links the forest type reference record to the condition forest type code recorded by field crews.
    - REF_FOREST_TYPE.VALUE = COND.FORTYPCDCALC links the forest type reference record to the condition forest type code calculated by an algorithm.
- REF_FOREST_TYPE_GROUP table – A reference table containing forest type grouping codes, and descriptive names. Data users should link codes as shown below and then obtain the information stored in MEANING to convert the code to a name.
    - REF_FOREST_TYPE_GROUP.VALUE = REF_FOREST_TYPE.TYPGRPCD links the forest type group reference record to the forest type reference record. To display the forest type group code, the forest type reference record must be linked to the condition record by linking REF_FOREST_TYPE.VALUE to COND.FORTYPCD, COND.FLDTYPCD, or COND.FORTYPCDCALC.
- REF_HABTYP_DESCRIPTION table – A reference table containing habitat type codes, and associated scientific plant species abbreviation and common name of each habitat type. Users wanting to know the publication that further describes the habitat type should link codes as shown below to obtain the corresponding publication information.
    - COND.HABTYPCD1 = REF_HABTYP_DESCRIPTION.HABTYPCD and COND.HABTYPCD1_DESCR_PUB_CD = REF_HABTYP_DESCRIPTION.PUB_CD and REF_HABTYP_DESCRIPTION.PUB_CD = REF_HABTYP_PUBLICATION.PUB_CD links the primary habitat type code to reference description habitat code and primary habitat type publication code to the reference description publication code and reference description publication code to the publication reference information. (see figure 6)
    - COND.HABTYPCD2 = REF_HABTYP_DESCRIPTION.HABTYPCD and COND.HABTYPCD2_DESCR_PUB_CD = REF_HABTYP_DESCRIPTION.PUB_CD and REF_HABTYP_DESCRIPTION.PUB_CD = REF_HABTYP_PUBLICATION.PUB_CD links the secondary habitat type code to reference description habitat code and secondary habitat type publication code to the

reference description publication code and reference description publication code to the publication reference information.

- REF_HABTYP_PUBLICATION table - A reference table containing the publication information (title, author) for the publication code. See the links described above in REF_HABTYP_DESCRIPTION.
- REF_INVASIVE_SPECIES table – A reference table containing the invasive species list by State.
  - REF_INVASIVE SPECIES.SYMBOL = INVASIVE_SUBPLOT_SPP.VEG_SPCD links the invasive species reference to the invasive species NRCS code.
  - REF_INVASIVE_SPECIES.SYMBOL = REF_PLANT_DICTIONARY.SYMBOL links the invasive species reference to the plant dictionary reference NRCS species code.
- REF_POP_ATTRIBUTE table – Identifies all of the population estimates that are currently supported, and provides information useful to the estimation procedure, such as how to calculate forest area.
  - REF_POP_ATTRIBUTE.ATTRIBUTE_NBR = POP_EVAL_ATTRIBUTE.ATTRIBUTE_NBR links the description of the unique population estimate to the records of evaluations that can be used to make those estimates.
- REF_POP_EVAL_TYP_DESCR table – A reference table containing the description for each evaluation type.
  - REF_POP_EVAL_TYP_DESCR.EVAL_TYP = POP_EVAL_TYP.EVAL_TYP links an evaluation type description reference record to an evaluation type record.
- REF_SPECIES table – A reference table containing the species code, descriptive common name, scientific name, and many other attributes for each species. For example, data users who want to convert the species code to the associated common name should link codes as shown below and then obtain the information stored in COMMON_NAME.
  - REF_SPECIES.SPCD = TREE.SPCD links the species reference table record to the tree species code.
  - REF_SPECIES.SPCD = SEEDLING.SPCD links the species reference table record to the seedling species code.
  - REF_SPECIES.SPCD = SITETREE.SPCD links the species reference table record to the site tree species code.
- REF_PLANT_DICTIONARY table – A reference table containing information about plant species as defined in the NRCS PLANTS database. The species symbol, common name, scientific name, growth habit and other identifying information are included in this table. Data users should link codes as shown below and then obtain the information stored in one of the columns such as COMMON_NAME or SCIENTIFIC_NAME to convert the code to a name.
  - REF_PLANT_DICTIONARY.SYMBOL = INVASIVE_SUBPLOT_SPP.VEG_SPCD links the plant dictionary reference species code to the invasive vegetation subplot NRCS species code.
  - REF_PLANT_DICTIONARY.SYMBOL = P2VEG_SUBPLOT_SPP.VEG_SPCD links the plant dictionary reference species code to the P2 vegetation subplot NRCS species code.
- REF_SPECIES_GROUP table – A reference table containing the species group code, descriptive name, and several other attributes for each species group. Data users should link

codes as shown below and then obtain the information stored in NAME to convert the code to a descriptive name.
  - REF_SPECIES_GROUP.SPGRPCD = TREE.SPGRPCD links the species group reference table to the tree species group code.
  - REF_SPECIES_GROUP.SPGRPCD = SEEDLING.SPGRPCD links the species reference table record to the seedling species group code.
  - REF_SPECIES_GROUP.SPGRPCD = SITETREE.SPGRPCD links the species reference table record to the site tree species group code.
- REF_STATE_ELEV table – Reference table containing information about minimum and maximum elevation found within a State.
  - REF_STATE_ELEV.STATECD = SURVEY.STATECD links the State elevation reference record to the survey record.
- REF_UNIT table – The description for each survey unit in a State.
  - REF_UNIT.STATECD = PLOT.STATECD and REF_UNIT.VALUE = PLOT.UNITCD links the survey unit description (MEANING) to the PLOT record.

Figure 4 helps to illustrate how the Phase 1 and other population estimation tables relate to one another and to the PLOT table.

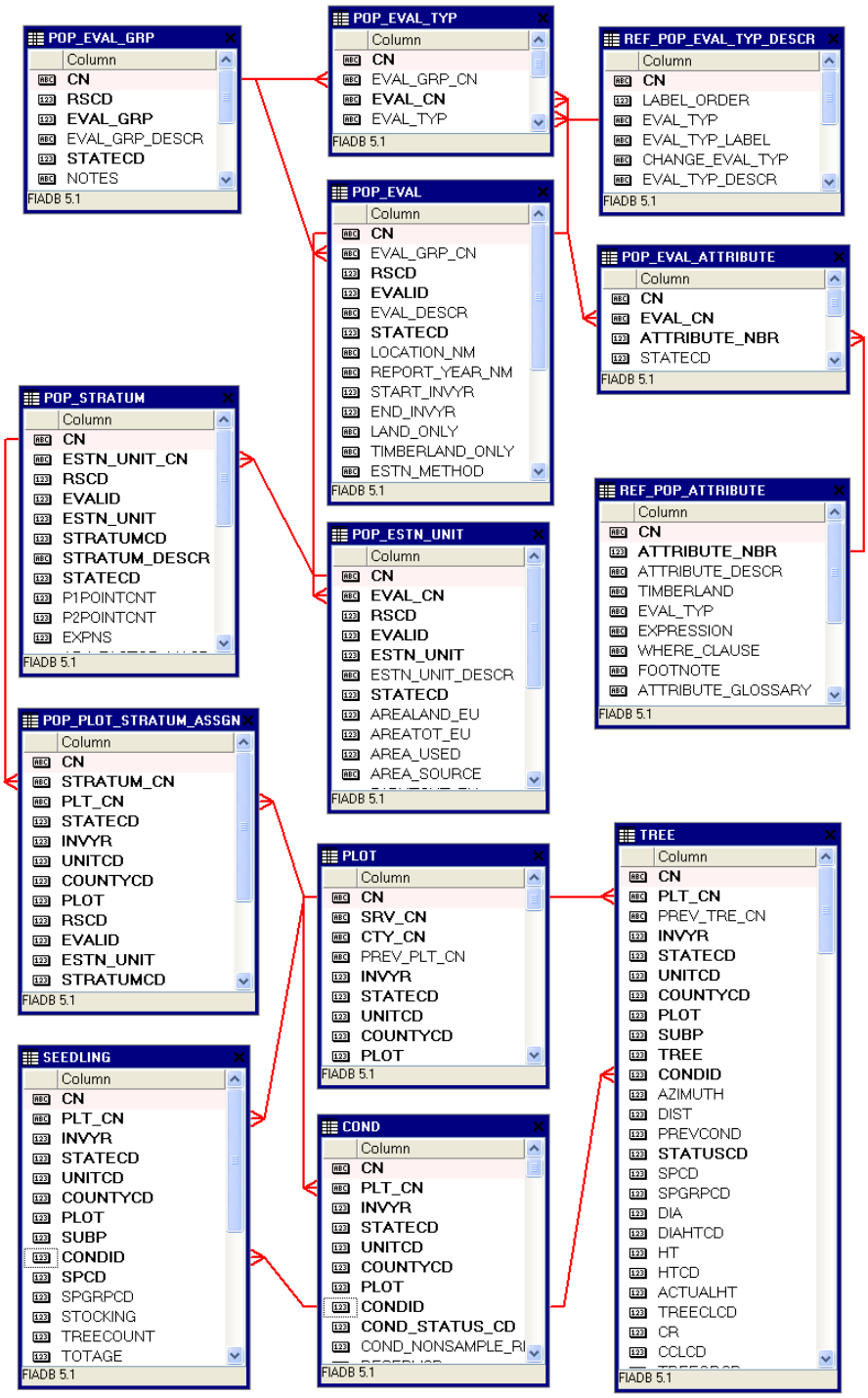


Figure 4. Relationships among Phase 1 and population estimation tables to the Phase 2 plot and other frequently used tables.

Keys Presented with the Tables

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

Primary key

A single column in a table whose values uniquely identify each row in an Oracle[1] table. The primary key in each FIADB 6.0 table is the CN column.

The name of the primary key for each table is listed in the table description. It follows the nomenclature of 'TABLEABBREVIATION'_PK. The table abbreviations are:

Table name	Table abbreviation
SURVEY	SRV
COUNTY	CTY
PLOT	PLT
COND	CND
SUBPLOT	SBP
SUBP_COND	SCD
BOUNDARY	BND
SUBP_COND_CHNG_MTRX	CMX
TREE	TRE
TREE_GRM_ESTN	TGE
TREE_REGIONAL_BIOMASS	TRB
SEEDLING	SDL
SITETREE	SIT
INVASIVE_SUBPLOT_SPP	ISS
P2VEG_SUBPLOT_SPP	P2VSSP
P2VEG_SUBP_STRUCTURE	P2VSS
DWM_VISIT	DVT
DWM_COARSE_WOODY_DEBRIS	DCW
DWM_DUFF_LITTER_FUEL	DDL
DWM_FINE_WOODY_DEBRIS	DFW
DWM_MICROPLOT_FUEL	DMF
DWM_RESIDUAL_PILE	DRP
DWM_TRANSECT_SEGMENT	DTS
COND_DWM_CALC	CDC
POP_ESTN_UNIT	PEU
POP_EVAL	PEV
POP_EVAL_ATTRIBUTE	PEA
POP_EVAL_GRP	PEG
POP_EVAL_TYP	PET
POP_PLOT_STRATUM_ASSGN	PPSA
POP_STRATUM	PSM
PLOTGEOM	PLOTGEOM
PLOTSNAP	PLOTSNP
REF_POP_ATTRIBUTE	PAE
REF_POP_EVAL_TYP_DESCR	PED

[1] The use of trade or firm names in this publication is for reader information only and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Table name	Table abbreviation
REF_FOREST_TYPE	RFT
REF_FOREST_TYPE_GROUP	FTGP
REF_SPECIES	SPC
REF_PLANT_DICTIONARY	RPD
REF_SPECIES_GROUP	SGP
REF_INVASIVE_SPECIES	RIS
REF_HABTYP_DESCRIPTION	RHN
REF_HABTYP_PUBLICATION	RPN
REF_CITATION	CIT
REF_FIADB_VERSION	RFN
REF_STATE_ELEV	RSE
REF_UNIT	UNT

Unique key

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

The unique key varies for each FIADB 6.0 table. The unique key for the PLOT table is STATECD, INVYR, UNITCD, COUNTYCD, and PLOT. The unique key for the COND table is PLT_CN and CONDID.

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

Natural key

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

Not all FIADB 6.0 tables have a natural key. For example, there is no natural key in the PLOT table, rather the natural key and the unique key are the same. The natural key for the COND table is STATECD, INVYR, UNITCD, COUNTYCD, PLOT, and CONDID.

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

Foreign key

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

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

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

The name of the foreign key for each table is listed in the table description. It follows the nomenclature of 'SOURCETABLEABBREVIATION'_'MATCHINGTABLEABBREVIATION'_FK, where the source table is the table containing the foreign key and the matching table is the table the foreign key matches. The foreign key usually matches the CN column of the matching table. Most tables in FIADB 6.0 have only one foreign key, but tables can have multiple foreign keys.

Oracle Data Types

Oracle data type	Definition
DATE	A data type that stores the date in the format of DD-MON-YYYY. For example, 29-AUG-2012.
NUMBER	A data type that contains only numbers, positive or negative, with a floating decimal point.
NUMBER(SIZE, D)	A data type that contains only numbers up to a specified maximum size. The maximum size (*and optional fixed decimal point*) is specified by the value(s) listed in the parentheses. For example, an attribute with a data type specified as "NUMBER(2)" indicates that the attribute may contain a maximum of two digits (*for example*, "11" or "5"), however, none of the digits are decimals. An attribute with a data type specified as "NUMBER(3,1)" may contain a maximum of three digits, however, the last digit is a fixed decimal (*for example*, "4.0" or "12.7"). Likewise, "NUMBER(6,4)" would indicate that an attribute may contain a maximum of six digits, however, the last four digits are part of a fixed decimal (*for example*, "18.7200"). Note: When needed, digits to the right of a fixed decimal point are filled in with zero(s).
VARCHAR2(SIZE)	A data type that contains alphanumeric data (numbers and/or characters) up to a specified maximum size. For example, an attribute with a data type specified as "VARCHAR2(8)" indicates that the attribute may contain a maximum of eight alphanumeric characters.

Survey Table (Oracle table name is SURVEY)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	INVYR	Inventory year	NUMBER(4)
3	P3_OZONE_IND	Phase 3 ozone indicator	VARCHAR2(1)
4	STATECD	State code	NUMBER(4)
5	STATEAB	State abbreviation	VARCHAR2(2)
6	STATENM	State name	VARCHAR2(28)
7	RSCD	Region or station code	NUMBER(2)
8	ANN_INVENTORY	Annual inventory	VARCHAR2(1)
9	NOTES	Notes	VARCHAR2(2000)
10	CREATED_BY	Created by	VARCHAR2(30)
11	CREATED_DATE	Created date	DATE
12	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
13	MODIFIED_BY	Modified by	
14	MODIFIED_DATE	Modified date	DATE
15	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
16	CYCLE	Inventory cycle number	NUMBER(2)
17	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	SRV_PK
Unique	STATECD, INVYR, P3_OZONE_IND, CYCLE	N/A	SRV_UK

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

2. INVYR — Inventory year. The year that best represents when the inventory data were collected. Under the annual inventory system, a group of plots is selected each year for sampling. The selection is based on a panel system. INVYR is the year in which the majority of plots in that group were collected (plots in the group have the same panel and, if applicable, subpanel). Under periodic inventory, a reporting inventory year was selected, usually based on the year in which the majority of the plots were collected or the mid-point of the years over which the inventory spanned. For either annual or periodic inventory, INVYR is not necessarily the same as MEASYEAR.

   Exceptions:
   INVYR = 9999. INVYR is set to 9999 to distinguish Phase 3 plots taken by the western FIA work units that are “off subpanel.” This is due to differences in measurement intervals between Phase 3 (measurement interval = 5 years) and Phase 2 (measurement interval = 10 years) plots. Only users interested in

performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

3. P3_OZONE_IND

   Phase 3 ozone indicator. Values are Y (yes) and N (no). If Y, then the Survey is for a P3 ozone inventory. If N, then the Survey is not for a P3 ozone inventory. Note that P3_OZONE_IND is part of the unique key because ozone data are stored as a separate inventory (survey); therefore, combinations of STATECD and INVYR may occur more than one time.

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

5. STATEAB State abbreviation. The two-character State abbreviation. Refer to appendix B.

6. STATENM State name. Refer to appendix B.

7. RSCD Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS)-Alaska
33	Southern Research Station (SRS)

8. ANN_INVENTORY

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

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

10. CREATED_BY Created by. The employee who created the record. This attribute is intentionally left blank in download files.

11. CREATED_DATE

    Created date. The date the record was created. Date will be in the form DD-MON-YYYY.

12. CREATED_IN_INSTANCE

    Created in instance. The database instance in which the record was created. Each computer system has a unique database instance code and this attribute stores that information to determine on which computer the record was created.

13. MODIFIED_BY

    Modified by. The employee who modified the record. This field will be blank (null) if the data have not been modified since initial creation. This attribute is intentionally left blank in download files.

14. MODIFIED_DATE

    Modified date. The date the record was last modified. This field will be blank (null) if the data have not been modified since initial creation. Date will be in the form DD-MON-YYYY.

15. MODIFIED_IN_INSTANCE

    Modified in instance. The database instance in which the record was modified. This field will be blank (null) if the data have not been modified since initial creation.

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

17. SUBCYCLE — Inventory subcycle number. For an annual inventory that takes n years to measure all plots, subcycle shows in which of the n years of the cycle the data were measured. Subcycle is 0 for a periodic inventory. Subcycle 99 may be used for plots that are not included in the estimation process.

County Table (Oracle table name is COUNTY)

	Column name	Descriptive name	Oracle data type
1	STATECD	State code	NUMBER(4)
2	UNITCD	Survey unit code	NUMBER(2)
3	COUNTYCD	County code	NUMBER(3)
4	COUNTYNM	County name	VARCHAR2(50)
5	CN	Sequence number	VARCHAR2(34)
6	CREATED_BY	Created by	VARCHAR2(30)
7	CREATED_DATE	Created date	DATE
8	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
9	MODIFIED_BY	Modified by	VARCHAR2(30)
10	MODIFIED_DATE	Modified date	DATE
11	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	CTY_PK
Unique	STATECD, UNITCD, COUNTYCD	N/A	CTY_UK

1. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B.

2. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

4. COUNTYNM County name. County name as recorded by the Bureau of the Census for individual counties, or the name given to a similar governmental unit by the FIA program. Only the first 50 characters of the name are used. Refer to appendix B for names.

5. CN Sequence number. A unique sequence number used to identify a county record.

6. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

7. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

8. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

9. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

10. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

11. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Plot Table (Oracle table name is PLOT)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	SRV_CN	Survey sequence number	VARCHAR2(34)
3	CTY_CN	County sequence number	VARCHAR2(34)
4	PREV_PLT_CN	Previous plot sequence number	VARCHAR2(34)
5	INVYR	Inventory year	NUMBER(4)
6	STATECD	State code	NUMBER(4)
7	UNITCD	Survey unit code	NUMBER(2)
8	COUNTYCD	County code	NUMBER(3)
9	PLOT	Phase 2 plot number	NUMBER(5)
10	PLOT_STATUS_CD	Plot status code	NUMBER(1)
11	PLOT_NONSAMPLE_REASN_CD	Plot nonsampled reason code	NUMBER(2)
12	MEASYEAR	Measurement year	NUMBER(4)
13	MEASMON	Measurement month	NUMBER(2)
14	MEASDAY	Measurement day	NUMBER(2)
15	REMPER	Remeasurement period	NUMBER(3,1)
16	KINDCD	Sample kind code	NUMBER(2)
17	DESIGNCD	Plot design code	NUMBER(4)
18	RDDISTCD	Horizontal distance to improved road code	NUMBER(2)
19	WATERCD	Water on plot code	NUMBER(2)
20	LAT	Latitude	NUMBER(8,6)
21	LON	Longitude	NUMBER(9,6)
22	ELEV	Elevation	NUMBER(5)
23	GROW_TYP_CD	Type of annual volume growth code	NUMBER(2)
24	MORT_TYP_CD	Type of annual mortality volume code	NUMBER(2)
25	P2PANEL	Phase 2 panel number	NUMBER(2)
26	P3PANEL	Phase 3 panel number	NUMBER(2)
27	ECOSUBCD	Ecological subsection code	VARCHAR2(7)
28	CONGCD	Congressional district code	NUMBER(4)
29	MANUAL	Manual (field guide) version number	NUMBER(3,1)
30	SUBPANEL	Subpanel	NUMBER(2)
31	KINDCD_NC	Sample kind code, North Central	NUMBER(2)
32	QA_STATUS	Quality assurance status	NUMBER(1)
33	CREATED_BY	Created by	VARCHAR2(30)
34	CREATED_DATE	Created date	DATE
35	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
36	MODIFIED_BY	Modified by	VARCHAR2(30)

	Column name	Descriptive name	Oracle data type
37	MODIFIED_DATE	Modified date	DATE
38	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
39	MICROPLOT_LOC	Microplot location	VARCHAR2(12)
40	DECLINATION	Declination	NUMBER(4,1)
41	EMAP_HEX	EMAP hexagon	NUMBER(7)
42	SAMP_METHOD_CD	Sample method code	NUMBER(1)
43	SUBP_EXAMINE_CD	Subplots examined code	NUMBER(1)
44	MACRO_BREAKPOINT_DIA	Macroplot breakpoint diameter	NUMBER(2)
45	INTENSITY	Intensity	VARCHAR2(3)
46	CYCLE	Inventory cycle number	NUMBER(2)
47	SUBCYCLE	Inventory subcycle number	NUMBER(2)
48	ECO_UNIT_PNW	Ecological unit, Pacific Northwest Research Station	VARCHAR2(10)
49	TOPO_POSITION_PNW	Topographic position, Pacific Northwest Research Station	VARCHAR2(2)
50	NF_SAMPLING_STATUS_CD	Nonforest sampling status code	NUMBER(1)
51	NF_PLOT_STATUS_CD	Nonforest plot status code	NUMBER(1)
52	NF_PLOT_NONSAMPLE_REASN_CD	Nonforest plot nonsampled reason code	NUMBER(2)
53	P2VEG_SAMPLING_STATUS_CD	P2 vegetation sampling status code	NUMBER(1)
54	P2VEG_SAMPLING_LEVEL_DETAIL_CD	P2 vegetation sampling level detail code	NUMBER(1)
55	INVASIVE_SAMPLING_STATUS_CD	Invasive sampling status code	NUMBER(1)
56	INVASIVE_SPECIMEN_RULE_CD	Invasive specimen rule code	NUMBER(1)
57	DESIGNCD_P2A	Design code phase 2A	NUMBER(4)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PLT_PK
Unique	STATECD, INVYR, UNITCD, COUNTYCD, PLOT	N/A	PLT_UK
Foreign	CTY_CN	PLOT to COUNTY	PLT_CTY_FK
Foreign	SRV_CN	PLOT to SURVEY	PLT_SRV_FK

1. CN Sequence number. A unique sequence number used to identify a plot record.
2. SRV_CN Survey sequence number. Foreign key linking the plot record to the survey record.
3. CTY_CN County sequence number. Foreign key linking the plot record to the county record.

4. PREV_PLT_CN

   Previous plot sequence number. Foreign key linking the plot record to the previous inventory's plot record for this location. Only populated on remeasurement plots.

5. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

7. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

9. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

10. PLOT_STATUS_CD

    Plot status code. A code that describes the sampling status of the plot. Blank (null) values may be present for periodic inventories.

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

11. PLOT_NONSAMPLE_REASN_CD

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

Code	Description
01	Outside U.S. boundary – Entire plot is outside of the U.S. border.
02	Denied access area – Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot.
03	Hazardous – Entire plot cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc.
05	Lost data – Plot data file was discovered to be corrupt after a panel was completed and submitted for processing.
06	Lost plot – Entire plot cannot be found.
07	Wrong location – Previous plot can be found, but its placement is beyond the tolerance limits for plot location.

Code	Description
08	Skipped visit – Entire plot skipped. Used for plots that are not completed prior to the time a panel is finished and submitted for processing. This code is for office use only.
09	Dropped intensified plot – Intensified plot dropped due to a change in grid density. This code used only by units engaged in intensification. This code is for office use only.
10	Other – Entire plot not sampled due to a reason other than one of the specific reasons already listed.
11	Ocean – Plot falls in ocean water below mean high tide line.

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

13. MEASMON Measurement month. The month in which the plot was completed. May be blank (null) for periodic inventory or when PLOT_STATUS_CD = 3.

Code	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

14. MEASDAY Measurement day. The day of the month in which the plot was completed. May be blank (null) for periodic inventory or when PLOT_STATUS_CD = 3.

15. REMPER Remeasurement period. The number of years between measurements for remeasured plots. This attribute is null (blank) for new plots or remeasured plots that are not used for growth, removals, or mortality estimates. For data processed with NIMS, REMPER is the number of years between measurements (to the nearest 0.1 year). For data processed with systems other than NIMS, remeasurement period is based on the number of growing seasons between measurements. Allocation of parts of the growing season by month is different for each FIA work unit. Contact the appropriate FIA work unit for information on how this is done for a particular State. **Note**: It is **not** valid to use REMPER to estimate periodic change.

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

Code	Description
0	Periodic inventory plot
1	Initial installation of a National design plot
2	Remeasurement of previously installed National design plot
3	Replacement of previously installed National design plot
4	Modeled periodic inventory plot (Northeastern and North Central only)

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

18. RDDISTCD Horizontal distance to improved road code. The straight-line distance from plot center to the nearest improved road, which is a road of any width that is maintained as evidenced by pavement, gravel, grading, ditching, and/or other improvements. Populated for all forested plots using the National Field Guide protocols (MANUAL ≥1.0) and populated by some FIA work units for inventory plots collected where MANUAL <1.0.

Code	Description
1	100 ft or less
2	101 ft to 300 ft
3	301 ft to 500 ft
4	501 ft 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

19. WATERCD Water on plot code. Water body <1 acre in size or a stream <30 feet wide that has the greatest impact on the area within the forest land portion of the four subplots. The coding hierarchy is listed in order from large permanent water to temporary water. Populated for all forested plots using the National Field Guide protocols (MANUAL ≥1.0) and populated by some FIA work units for inventory plots collected where MANUAL <1.0.

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

20. LAT Latitude. The approximate latitude of the plot in decimal degrees using NAD 83 datum. Actual plot coordinates cannot be released because of a Privacy provision enacted by Congress in the Food Security Act of 1985. Therefore, this attribute is approximately +/- 1 mile and, for annual inventory data, most

plots are within +/- ½ mile. Annual data have additional uncertainty for private plots caused by swapping plot coordinates for up to 20 percent of the plots. In some cases, the county centroid is used when the actual coordinate is not available.

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

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

23. GROW_TYP_CD

Type of annual volume growth code. A code indicating how volume growth is estimated. Current annual growth is an estimate of the amount of volume that was added to a tree in the year before the tree was sampled, and is based on the measured diameter increment recorded when the tree was sampled or on a modeled diameter for the previous year. Periodic annual growth is an estimate of the average annual change in volume occurring between two measurements, usually the current inventory and the previous inventory, where the same plot is evaluated twice. Periodic annual growth is the increase in volume between inventories divided by the number of years between each inventory. This attribute is blank (null) if the plot does not contribute to the growth estimate.

Code	Description
1	Current annual
2	Periodic annual

24. MORT_TYP_CD

Type of annual mortality volume code. A code indicating how mortality volume is estimated. Current annual mortality is an estimate of the volume of trees dying in the year before the plot was measured, and is based on the year of death or on a modeled estimate. Periodic annual mortality is an estimate of the average annual volume of trees dying between two measurements, usually the current inventory and previous inventory, where the same plot is evaluated twice. Periodic annual mortality is the loss of volume between inventories divided by the number of years between each inventory. Periodic average annual mortality is the most common type of annual mortality estimated. This attribute is blank (null) if the plot does not contribute to the mortality estimate.

Code	Description
1	Current annual
2	Periodic annual

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

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

27. ECOSUBCD — Ecological subsection code. An area of similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities. Subsection boundaries usually correspond with discrete changes in geomorphology. Subsection information is used for broad planning and assessment. Subsection codes for the coterminous United States were developed as part of the "Forest Service Map of Provinces, Sections, and Subsections of the United States (Cleland and others 2007) (visit http://fsgeodata.fs.fed.us/other_resources/ecosubregions.html). For southeast and south coastal Alaska, the subsection codes are based on the ecological sections as designated in the "Ecoregions and Subregions of Alaska, EcoMap version 2.0" (Nowacki and Brock 1995) (visit http://agdcftp1.wr.usgs.gov/pub/projects/fhm/ecomap.gif). The ECOSUBCD is based on fuzzed and swapped plot coordinates. This attribute is coded for the coterminous United States, southeast and south coastal Alaska, and is left blank (null) in all other instances.

28. CONGCD — Congressional district code. A territorial division of a State from which a member of the U.S. House of Representatives is elected. The congressional district code assigned to a plot (regardless of when it was measured) is for the current Congress; the assignment is made based on the plot's approximate coordinates. CONGCD is a four-digit number. The first two digits are the State FIPS code and the last two digits are the congressional district number. If a State has only one congressional district, the congressional district number is 00. If a plot's congressional district assignment falls in a State other than the plot's actual State due to using the approximate coordinates, the congressional district code will be for the nearest congressional district in the correct State. This attribute is coded for the coterminous States and Alaska, and is left blank (null) in all other instances. For more information about the coverage used to assign this attribute, see National Atlas of the United States (2007).

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

30. SUBPANEL Subpanel. Subpanel assignment for the plot for those FIA work units using subpaneling. FIA uses a 5-panel (see P2PANEL) and a 14-subpanel system to select plot sampling for each year of a cycle. This attribute is left blank (null) if subpaneling is not used.

31. KINDCD_NC Sample kind code, North Central. This attribute is populated through 2005 for the former North Central work unit (SURVEY.RSCD = 23) and is blank (null) for all other FIA work units.

Code	Description
0	New/lost
6	Remeasured
8	Old location but not remeasured
20	Skipped
33	Replacement of lost plot

32. QA_STATUS Quality assurance status. A code indicating the type of plot data collected. Populated for all forested subplots using the National Field Guide protocols (MANUAL ≥ 1.0).

Code	Description
1	Standard production plot
2	Cold check
3	Reference plot (off grid)
4	Training/practice plot (off grid)
5	Botched plot file (disregard during data processing)
6	Blind check
7	Production plot (hot check)

33. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

34. CREATED_DATE

Created date. See SURVEY.CREATED_DATE description for definition.

35. CREATED_IN_INSTANCE

Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

36. MODIFIED_BY

Modified by. See SURVEY.MODIFIED_BY description for definition.

37. MODIFIED_DATE

Modified date. See SURVEY.MODIFIED_DATE description for definition.

38. MODIFIED_IN_INSTANCE

Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

39. MICROPLOT_LOC

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

40. DECLINATION

Declination. (*Core optional*) 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 work unit historically has corrected all compass readings for true north. This field is to be used only in cases where FIA work units are adjusting azimuths to correspond to true north; for FIA work 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)

41. EMAP_HEX EMAP hexagon. The identifier for the approximately 160,000 acre Environmental Monitoring and Assessment Program (EMAP) hexagon in which the plot is located. EMAP hexagons are available to the public, cover the coterminous United States, and have been used in summarizing and aggregating data about numerous natural resources. Populated for annual inventory and may be populated for periodic inventory.

42. SAMP_METHOD_CD

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

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

43. SUBP_EXAMINE_CD

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

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

44. MACRO_BREAKPOINT_DIA

Macroplot breakpoint diameter. (*Core optional*) A macroplot breakpoint diameter is the diameter (either DBH or DRC) above which trees are measured on the plot extending from 0.01 to 58.9 feet horizontal distance from the center of each subplot. Examples of different breakpoint diameters used by western FIA work 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. If macroplots are not being installed, this item will be left blank (null).

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

46. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

47. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

48. ECO_UNIT_PNW

Ecological unit, Pacific Northwest Research Station. Plots taken by PNW FIA are assigned to the ecological unit in which they are located. Certain units have stocking adjustments made to the plots that occur on very low productivity lands, which thereby reduces the estimated potential productivity of the plot. More information can be found in MacLean (1973). Only collected by certain FIA work units (SURVEY.RSCD = 26 or 27).

49. TOPO_POSITION_PNW

Topographic position, Pacific Northwest Research Station. The topographic position that describes the plot area. Illustrations available in Plot section of PNW field guide located at: http//www.fs.fed.us/pnw/fia/publications/fieldmanuals.shtml. Adapted from information found in Wilson (1900). Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Topographic position	Common shape of slope
1	Ridge top or mountain peak over 130 feet	Flat
2	Narrow ridge top or mountain peak over 130 feet wide	Convex
3	Side hill – upper 1/3	Convex
4	Side hill – middle 1/3	No rounding
5	Side hill – lower 1/3	Concave
6	Canyon bottom less than 660 feet wide	Concave
7	Bench, terrace or dry flat	Flat
8	Broad alluvial flat over 660 feet wide	Flat
9	Swamp or wet flat	Flat

50. NF_SAMPLING_STATUS_CD

Nonforest sampling status code. A code indicating whether or not the plot is part of a nonforest inventory. If NF_SAMPLING_STATUS_CD = 1, then the entire suite of attributes that are measured on the forest lands were measured and only those suites of attributes that are measured on forest lands can be measured on nonforest lands.

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

51. NF_PLOT_STATUS_CD

Nonforest plot status code. A code describing the sampling status of the nonforest plot.

Code	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

52. NF_PLOT_NONSAMPLE_REASN_CD

Nonforest plot nonsampled reason code. A code indicating the reason the nonforest plot was not sampled.

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

53. P2VEG_SAMPLING_STATUS_CD

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

Code	Description
0	Not sampling P2 Vegetation
1	P2Vegetation data collected only on accessible forest land conditions (COND_STATUS_CD = 1 and NF_SAMPLING_STATUS_CD = 0)
2	P2Vegetation data collected on all accessible land conditions (COND_STATUS_CD = 1 or NF_SAMPLING_STATUS_CD = 2)

54. P2VEG_SAMPLING_LEVEL_DETAIL_CD

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

Code	Description
1	Data collected for vegetation structure only; total aerial 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	Vegetation structure data (LOD = 1) **plus** understory species composition data collected including up to four most abundant species per GROWTH_HABIT_CD per subplot of: seedlings and saplings of any tree species (tally or non-tally) <5 inches DBH (DRC for woodland species), shrubs/subshrubs/woody vines, forbs, and graminoids.
3	Vegetation structure data, understory species composition data (LOD = 2), **plus** up to four most abundant tree species (tally or non-tally) ≥5 inches DBH (DRC for woodland species) per GROWTH_HABIT_CD per subplot.

55. INVASIVE_SAMPLING_STATUS_CD

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

Code	Description
0	Not collecting invasive plant data
1	Invasive plant data collected only on accessible forest land conditions (COND_STATUS_CD = 1)
2	Invasive plant data collected on all accessible land conditions (COND_STATUS_CD = 1 OR NF_COND_STATUS_CD = 2)

56. INVASIVE_SPECIMEN_RULE_CD

Invasive specimen rule code. A code indicating if specimen collection was required.

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

57. DESIGNCD_P2A

Design code periodic to annual. The plot design for the periodic plots that were remeasured in the annual inventory (DESIGNCD = 1). Refer to appendix I for a list of codes and descriptions.

Condition Table (Oracle table name is COND)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	UNITCD	Survey unit code	NUMBER(2)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER(5)
8	CONDID	Condition class number	NUMBER(1)
9	COND_STATUS_CD	Condition status code	NUMBER(1)
10	COND_NONSAMPLE_REASN_CD	Condition nonsampled reason code	NUMBER(2)
11	RESERVCD	Reserved status code	NUMBER(2)
12	OWNCD	Owner class code	NUMBER(2)
13	OWNGRPCD	Owner group code	NUMBER(2)
14	FORINDCD	Private owner industrial status code	NUMBER(2)
15	ADFORCD	Administrative forest code	NUMBER(4)
16	FORTYPCD	Forest type code, derived by algorithm	NUMBER(3)
17	FLDTYPCD	Field forest type code	NUMBER(3)
18	MAPDEN	Mapping density	NUMBER(1)
19	STDAGE	Stand age	NUMBER(4)
20	STDSZCD	Stand-size class code derived by algorithm	NUMBER(2)
21	FLDSZCD	Field stand-size class code	NUMBER(2)
22	SITECLCD	Site productivity class code	NUMBER(2)
23	SICOND	Site index for the condition	NUMBER(3)
24	SIBASE	Site index base age	NUMBER(3)
25	SISP	Site index species code	NUMBER(4)
26	STDORGCD	Stand origin code	NUMBER(2)
27	STDORGSP	Stand origin species code	NUMBER
28	PROP_BASIS	Proportion basis	VARCHAR2(12)
29	CONDPROP_UNADJ	Condition proportion unadjusted	NUMBER(5,4)
30	MICRPROP_UNADJ	Microplot proportion unadjusted	NUMBER(5,4)
31	SUBPPROP_UNADJ	Subplot proportion unadjusted	NUMBER(5,4)
32	MACRPROP_UNADJ	Macroplot proportion unadjusted	NUMBER(5,4)
33	SLOPE	Slope	NUMBER(3)
34	ASPECT	Aspect	NUMBER(3)
35	PHYSCLCD	Physiographic class code	NUMBER(2)
36	GSSTKCD	Growing-stock stocking code	NUMBER(2)

	Column name	Descriptive name	Oracle data type
37	ALSTKCD	All live stocking code	NUMBER(2)
38	DSTRBCD1	Disturbance 1 code	NUMBER(2)
39	DSTRBYR1	Disturbance year 1	NUMBER(4)
40	DSTRBCD2	Disturbance 2 code	NUMBER(2)
41	DSTRBYR2	Disturbance year 2	NUMBER(4)
42	DSTRBCD3	Disturbance 3 code	NUMBER(2)
43	DSTRBYR3	Disturbance year 3	NUMBER(4)
44	TRTCD1	Stand treatment 1 code	NUMBER(2)
45	TRTYR1	Treatment year 1	NUMBER(4)
46	TRTCD2	Stand treatment 2 code	NUMBER(2)
47	TRTYR2	Treatment year 2	NUMBER(4)
48	TRTCD3	Stand treatment 3 code	NUMBER(2)
49	TRTYR3	Treatment year 3	NUMBER(4)
50	PRESNFCD	Present nonforest code	NUMBER(2)
51	BALIVE	Basal area of live trees	NUMBER(9,4)
52	FLDAGE	Field-recorded stand age	NUMBER(4)
53	ALSTK	All-live-tree stocking percent	NUMBER(7,4)
54	GSSTK	Growing-stock stocking percent	NUMBER(7,4)
55	FORTYPCDCALC	Forest type code calculated	NUMBER(3)
56	HABTYPCD1	Habitat type code 1	VARCHAR2(10)
57	HABTYPCD1_PUB_CD	Habitat type code 1 publication code	VARCHAR2(10)
58	HABTYPCD1_DESCR_ PUB_CD	Habitat type code 1 description publication code	VARCHAR2(10)
59	HABTYPCD2	Habitat type code 2	VARCHAR2(10)
60	HABTYPCD2_PUB_CD	Habitat type code 2 publication code	VARCHAR2(10)
61	HABTYPCD2_DESCR_PUB_CD	Habitat type code 2 description publication code	VARCHAR2(10)
62	MIXEDCONFCD	Mixed conifer code	VARCHAR2(1)
63	VOL_LOC_GRP	Volume location group	VARCHAR2(200)
64	SITECLCDEST	Site productivity class code estimated	NUMBER(2)
65	SITETREE_TREE	Site tree tree number	NUMBER(4)
66	SITECL_METHOD	Site class method	NUMBER(2)
67	CARBON_DOWN_DEAD	Carbon in down dead	NUMBER(13,6)
68	CARBON_LITTER	Carbon in litter	NUMBER(13,6)
69	CARBON_SOIL_ORG	Carbon in soil organic material	NUMBER(13,6)
70	CARBON_STANDING_DEAD	Carbon in standing dead trees	NUMBER(13,6)
71	CARBON_UNDERSTORY_AG	Carbon in the understory aboveground	NUMBER(13,6)
72	CARBON_UNDERSTORY_BG	Carbon in the understory belowground	NUMBER(13,6)

	Column name	Descriptive name	Oracle data type
73	CREATED_BY	Created by	VARCHAR2(30)
74	CREATED_DATE	Created date	DATE
75	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
76	MODIFIED_BY	Modified by	VARCHAR2(30)
77	MODIFIED_DATE	Modified date	DATE
78	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
79	CYCLE	Inventory cycle number	NUMBER(2)
80	SUBCYCLE	Inventory subcycle number	NUMBER(2)
81	SOIL_ROOTING_DEPTH_PNW	Soil rooting depth, Pacific Northwest Research Station	VARCHAR2(1)
82	GROUND_LAND_CLASS_PNW	Present ground land class, Pacific Northwest Research Station	VARCHAR2(3)
83	PLANT_STOCKABILITY_FACTOR_PNW	Plant stockability factor, Pacific Northwest Research Station	NUMBER
84	STND_COND_CD_PNWRS	Stand condition code, Pacific Northwest Research Station	NUMBER(1)
85	STND_STRUC_CD_PNWRS	Stand structure code, Pacific Northwest Research Station	NUMBER(1)
86	STUMP_CD_PNWRS	Stump code, Pacific Northwest Research Station	VARCHAR2(1)
87	FIRE_SRS	Fire, Southern Research Station	NUMBER(1)
88	GRAZING_SRS	Grazing, Southern Research Station	NUMBER(1)
89	HARVEST_TYPE1_SRS	Harvest type code 1, Southern Research Station	NUMBER(2)
90	HARVEST_TYPE2_SRS	Harvest type code 2, Southern Research Station	NUMBER(2)
91	HARVEST_TYPE3_SRS	Harvest type code 3, Southern Research Station	NUMBER(2)
92	LAND_USE_SRS	Land use, Southern Research Station	NUMBER(2)
93	OPERABILITY_SRS	Operability, Southern Research Station	NUMBER(2)
94	STAND_STRUCTURE_SRS	Stand structure, Southern Research Station	NUMBER(2)
95	NF_COND_STATUS_CD	Nonforest condition status code	NUMBER(1)
96	NF_COND_NONSAMPLE_REASN_CODE	Nonforest condition nonsampled reason code	NUMBER(2)
97	CANOPY_CVR_SAMPLE_METHOD_CD	Canopy cover sample method code	NUMBER(2)
98	LIVE_CANOPY_CVR_PCT	Live canopy cover percent	NUMBER(3)
99	LIVE_MISSING_CANOPY_CVR_PCT	Live plus missing canopy cover percent	NUMBER(3)
100	NBR_LIVE_STEMS	Number of live stems	NUMBER(5)
101	OWNSUBCD	Owner subclass code	NUMBER(1)
102	INDUSTRIALCD_FIADB	Industrial code	NUMBER(1)
103	RESERVCD_5	Reserve code field	NUMBER(1)
104	ADMIN_WITHDRAWN_CD	Administratively withdrawn code	NUMBER(1)

	Column name	Descriptive name	Oracle data type
105	CHAINING_CD	Chaining code	NUMBER(1)
106	LAND_COVER_CLASS_CD	Land cover class	NUMBER(2)
107	AFFORESTATION_CD	Current afforestation code	NUMBER(1)
108	PREV_AFFORESTATION_CD	Previous afforestation code	NUMBER(1)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	CND_PK
Unique	PLT_CN, CONDID	N/A	CND_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, CONDID	N/A	CND_NAT_I
Foreign	PLT_CN	CONDITION to PLOT	CND_PLT_FK

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

2. PLT_CN — Plot sequence number. Foreign key linking the condition record to the plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

5. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

7. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of variables, PLOT may be used to uniquely identify a plot.

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

On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

9. COND_STATUS_CD

Condition status code. A code indicating the basic land classification. **Note**: Starting with FIADB version 6.0, Codes 1 and 2 have been modified to match FIA's new definition for accessible forest land and nonforest land.

Code	Description
1	Accessible forest land – Land within the population of interest that can be occupied safely and has at least 10 percent crown cover by live tally trees 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. To qualify, the area must be at least 1.0 acre in size and 120.0 feet wide. Forest land includes transition zones, such as areas between forest and nonforest lands that meet the minimal tree stocking/cover and forest areas adjacent to urban and built-up lands. Roadside, streamside, and shelterbelt strips of trees must have a width of at least 120 feet and continuous length of at least 363 feet to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if they are less than 120 feet wide or less than an acre in size. Tree-covered areas in agricultural production settings, such as fruit orchards, or tree-covered areas in urban settings, such as city parks, are not considered forest land.
2	Nonforest land –Land that has less than 10 percent canopy cover of tally tree species of any size 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 PRESNFCD). Nonforest includes areas that have sufficient cover or live stems to meet the forest land definition, but do not meet the dimensional requirements. **Note**: Nonforest land includes "other wooded land" that 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. Other wooded land 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 PRESNFCD = 20, 40, 42, 43 or 45.
3	Noncensus water – Lakes, reservoirs, ponds, and similar bodies of water 1.0 acre to 4.5 acre in size. Rivers, streams, canals, etc., 30.0 feet to 200 feet wide. This definition was used in the 1990 census and applied when the data became available. Earlier inventories defined noncensus water differently.
4	Census water – Lakes, reservoirs, ponds, and similar bodies of water 4.5 acre in size and larger; and rivers, streams, canals, etc., more than 200 feet wide.
5	Nonsampled, possibility of forest land- Any portion of a plot within accessible forest land that cannot be sampled is delineated as a separate condition. There is no minimum size requirement. The reason the condition was not sampled is provided in COND_NONSAMPLE_REASN_CD.

10. COND_NONSAMPLE_REASN_CD

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

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

11. RESERVCD Reserved status code. (*Core for accessible forestland; Core optional for other sampled land*) A code indicating the reserved status of the condition on publically-owned land. Starting with FIADB version 6.0, the description has been modified to match FIA's new application of the definition for reserved land. Reserved land is permanently prohibited from being managed for the production of wood products through statute or agency mandate; the prohibition cannot be changed through decision of the land manager. Logging may occur to meet protected area objectives. Examples include designated federal Wilderness areas, National Parks and Monuments, and most State Parks. Private land cannot be reserved. RESERVCD differs from RESERVCD_5, which stores reserved status based on the previous definition. See appendix N for applications of RESERVCD by FIA region and State.

Code	Description
0	Not reserved
1	Reserved

12. OWNCD Owner class code. (*Core for all accessible forestland; Core optional for other sampled land*) A code indicating the class in which the landowner (at the time of the inventory) belongs. When PLOT.DESIGNCD = 999, OWNCD may be blank (null).

Code	Description
11	National Forest
12	National Grassland and/or Prairie
13	Other Forest Service Land
21	National Park Service
22	Bureau of Land Management
23	Fish and Wildlife Service

Code	Description
24	Departments of Defense/Energy
25	Other Federal
31	State including State public universities
32	Local (County, Municipality, etc.) including water authorities
33	Other Non-federal Public
46	Undifferentiated private

The following detailed private owner land codes are not available in this database because of the FIA data confidentiality policy. Users needing this type of information should contact the FIA Spatial Data Services (SDS) group by following the instructions provided at: http://www.fia.fs.fed.us/tools-data/spatial/.

Code	Description
41	Corporate, including Native Corporations in Alaska and private universities
42	Non-governmental conservation/natural resources organization
43	Unincorporated local partnership/association/club
44	Native American (Indian)
45	Individual and Family, including trusts, estates, and family partnerships

13. OWNGRPCD Owner group code. (*Core for all accessible forestland; Core optional for other sampled land*) A broader group of landowner classes. When PLOT.DESIGNCD = 999, OWNGRPCD may be blank (null).

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

14. FORINDCD Private owner industrial status code. (*Core for all accessible forestland where owner group is private; Core optional for other sampled land where owner group is private*) A code indicating whether the landowner owns and operates a primary wood-processing plant. A primary wood-processing plant is any commercial operation that originates the primary processing of wood on a regular and continuing basis. Examples include: pulp or paper mill, sawmill, panel board mill, post or pole mill.

This attribute is retained in this database for informational purposes but is intentionally left blank (null) because of the FIA data confidentiality policy. Users needing this type of information should contact the FIA Spatial Data Services (SDS) group by following the instructions provided at: http://www.fia.fs.fed.us/tools-data/spatial/.

Code	Description
0	Land is not owned by industrial owner with wood-processing plant.
1	Land is owned by industrial owner with wood-processing plant.

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

16. FORTYPCD — Forest type code. This is the forest type used for reporting purposes. It is primarily derived using a computer algorithm, except when less than 25 percent of the plot samples a particular forest condition or in a few cases where the derived FORTYPCDCALC does not accurately reflect the actual condition.

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

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

17. FLDTYPCD — Field forest type code. Forest type, assigned by the field crew, based on the tree species or species groups forming a plurality of all live stocking. The field crew assesses the forest type based on the acre of forestland around the plot, in addition to the species sampled on the condition. Refer to appendix D for a detailed list of forest type codes and names. Nonstocked forest land is land that currently has less than 10 percent stocking but formerly met the definition of forest land. When PLOT.MANUAL <2.0, forest conditions that do not meet this stocking level were coded FLDTYPCD = 999. Beginning with manual version 2.0, the crew no longer recorded nonstocked as 999. Instead, they recorded FLDSZCD = 0 to identify nonstocked conditions and entered an estimated forest type for the condition. The crew determined the estimated forest type by either recording the previous forest type on remeasured plots or, on all other plots, the most appropriate forest type to the condition based on the seedlings present or the forest type of the adjacent forest stands. Periodic inventories will differ in the way FLDTYPCD was recorded – it is best to check with individual FIA work units for details. In general, when FLDTYPCD is used for analysis, it is necessary to examine the values of both FLDTYPCD and FLDSZCD to identify nonstocked forest land.

18. MAPDEN — Mapping density. A code indicating the relative tree density of the condition. Codes other than 1 are used as an indication that a significant difference in tree density is the only factor causing another condition to be recognized and mapped on the plot. May be blank (null) for periodic inventories.

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

19. STDAGE Stand age. For annual inventories (PLOT.MANUAL ≥1.0), stand age is equal to the field-recorded stand age (FLDAGE) with some exceptions:

- If FLDAGE = 999, then stand age is computed
- When FLDAGE = 998, STDAGE may be blank (null) because no trees were cored in the field
- RMRS computes stand age using field-recorded tree ages from trees in the calculated stand-size class. If no tree ages are available, then RMRS sets this attribute equal to FLDAGE.

For annual inventories, nonstocked stands have STDAGE set to 0. When FLDSZCD = 0 (nonstocked) but STDSZCD <5 (not nonstocked), STDAGE may be set to 0 because FLDAGE = 0. In periodic inventories, stand age is determined using local procedures. Annual inventory data will contain stand ages assigned to the nearest year. For some older inventories, stand age was set to 10-year classes for stands <100 years old, 20-year age classes for stands between 100 and 200 years, and 100-year age classes if older than 200 years. These classes were converted to store the midpoint of the age class in years. Blank (null) values in the periodic data (PLOT.MANUAL <1.0) indicate that the stand was recorded as mixed age on forested condition classes. Age is difficult to measure and therefore STDAGE may have large measurement errors.

20. STDSZCD Stand-size class code. A classification of the predominant (based on stocking) diameter class of live trees within the condition assigned using an algorithm. Large diameter trees are at least 11.0 inches diameter for hardwoods and at least 9.0 inches diameter for softwoods. Medium diameter trees are at least 5.0 inches diameter and smaller than large diameter trees. Small diameter trees are <5.0 inches diameter. When <25 percent of the plot samples the forested condition (CONDPROP_UNADJ <0.25), this attribute is set to the equivalent field-recorded stand-size class (FLDSZCD). Populated for all forest annual plots, all forest periodic plots, and all NCRS periodic plots that were measured as "nonforest with trees" (e.g., wooded pasture, windbreaks). This attribute is blank (null) for periodic plots that are used only for growth, mortality and removal estimates, and modeling of reserved and unproductive conditions.

Code	Description
1	Large diameter – Stands with an all live stocking of at least 10 (base 100); with more than 50 percent of the stocking in medium and large diameter trees; and with the stocking of large diameter trees equal to or greater than the stocking of medium diameter trees
2	Medium diameter – Stands with an all live stocking of at least 10 (base 100); with more than 50 percent of the stocking in medium and large diameter trees; and with the stocking of large diameter trees less than the stocking of medium diameter trees

Code	Description
3	Small diameter – Stands with an all live stocking value of at least 10 (base 100) on which at least 50 percent of the stocking is in small diameter trees
5	Nonstocked – Forest land with all live stocking <10

21. FLDSZCD Field stand-size class code. Field-assigned classification of the predominant (based on stocking) diameter class of live trees within the condition. Blank (null) values may be present for periodic inventories.

Code	Description
0	Nonstocked – Meeting the definition of accessible land and one of the following applies (1) <10 percent stocked by trees, seedlings, and saplings and not classified as cover trees, or (2) for several woodland species where stocking standards are not available, <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 <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 one-third of the canopy cover is in trees >5.0 inches DBH/DRC and the plurality of the canopy cover is in softwoods 5.0 – 8.9 inches diameter and/or hardwoods 5.0 –10.9 inches DBH, and/or for 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 sapling; and at least one-third of the canopy cover is in trees >5.0 inches DBH/DRC and the plurality of the canopy cover is in softwoods 9.0 – 19.9 inches diameter and/or hardwoods between 11.0 –19.9 inches DBH, and for woodland trees 9.0 – 19.9 inches DRC.
4	20.0 – 39.9 inches. At least 10 percent stocking (or 10 percent canopy cover if stocking standards are not available) in trees, seedlings, and saplings; and at least one-third of the canopy cover is in trees >5.0 inches DBH/DRC and the plurality of the canopy cover is in trees 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 one-third of the canopy cover is in trees >5.0 inches DBH/DRC and the plurality of the canopy cover is in trees ≥40.0 inches DBH.

22. SITECLCD Site productivity class code. A classification of forest land in terms of inherent capacity to grow crops of industrial wood. Identifies the potential growth in cubic feet/acre/year and is based on the culmination of mean annual increment of fully stocked natural stands. For data stored in the database that were processed outside of NIMS, this variable may be assigned based on the site productivity determined with the site trees, or from some other source, but the actual source of the site productivity class code is not known. For data processed with NIMS, this variable may either be assigned based on the site trees available for the plot, or, if no valid site trees are available, this variable is set equal to SITECLCDEST, a default value that is either an estimated or predicted site productivity class. If SITECLCDEST is used to populate SITECLCD, the variable SITECL_METHOD is set to 6.

Code	Description
1	225+ cubic feet/acre/year
2	165-224 cubic feet/acre/year
3	120-164 cubic feet/acre/year
4	85-119 cubic feet/acre/year

Code	Description
5	50-84 cubic feet/acre/year
6	20-49 cubic feet/acre/year
7	0-19 cubic feet/acre/year

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

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

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

26. STDORGCD — Stand origin code. Method of stand regeneration for the trees in the condition. An artificially regenerated stand is established by planting or artificial seeding. Populated for all forest annual plots, all forest periodic plots, and all NCRS periodic plots that were measured as “nonforest with trees” (e.g., wooded pasture, windbreaks).

Code	Description
0	Natural stands
1	Clear evidence of artificial regeneration

27. STDORGSP — Stand origin species code. The species code for the predominant artificially regenerated species (only when STDORGCD = 1). See appendix F. May not be populated for some FIA work units when PLOT.MANUAL <1.0.

28. PROP_BASIS — Proportion basis. A value indicating what type of fixed-size subplots were installed when this plot was sampled. This information is needed to use the proper adjustment factor for the stratum in which the plot occurs (see POP_STRATUM.ADJ_FACTOR_SUBP and POP_STRATUM.ADJ_FACTOR_MACR.) Usually 24-foot radius subplots are installed and in this case, the value for PROP_BASIS is “SUBP.”

However, when 58.9-foot radius macroplots are installed, the value is "MACR." This attribute is blank (null) for periodic inventories.

29. CONDPROP_UNADJ

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

30. MICRPROP_UNADJ

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

31. SUBPPROP_UNADJ

Subplot proportion unadjusted. The unadjusted proportion of the subplots that are in the condition. The sum of all subplot condition proportions for a plot equals 1.

32. MACRPROP_UNADJ

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

33. SLOPE Slope. The angle of slope, in percent, of the condition. Valid values are 000 through 155 for data collected when PLOT.MANUAL ≥1.0, and 000 through 200 on data collected when PLOT.MANUAL <1.0. When PLOT.MANUAL <1.0, the field crew measured condition slope by sighting along the average incline or decline of the condition. When PLOT.MANUAL ≥1.0, slope is collected on subplots but no longer collected for conditions. When PLOT.MANUAL ≥1.0, the slope from the subplot representing the greatest percentage of the condition is assigned as a surrogate. In the event that two or more subplots represent the same amount of area in the condition, the slope from the lower numbered subplot is used. Populated for all forest annual plots, all forest periodic plots, and all NCRS periodic plots that were measured as "nonforest with trees" (e.g., wooded pasture, windbreaks).

34. ASPECT Aspect. The direction of slope, to the nearest degree, for most of the condition. North is recorded as 360. When slope is <5 percent, there is no aspect and this item is set to zero. When PLOT.MANUAL <1.0, the field

crew measured condition aspect. When PLOT.MANUAL ≥1.0, aspect is collected on subplots but no longer collected for conditions. **Note**: For plots measured when PLOT.MANUAL ≥1.0, the aspect from the subplot representing the greatest percentage of the condition is assigned as a surrogate. In the event that two or more subplots represent the same percentage of area in the condition, the slope from the lower numbered subplot is used. Populated for all forest annual plots, all forest periodic plots, and all NCRS periodic plots that were measured as "nonforest with trees" (e.g., wooded pasture, windbreaks).

35. PHYSCLCD Physiographic class code. The general effect of land form, topographical position, and soil on moisture available to trees. These codes are new in annual inventory; older inventories have been updated to these codes when possible. Also populated for the NCRS periodic plots that were measured as "nonforest with trees" (e.g., wooded pasture, windbreaks).

Code	Description
	Xeric sites (normally low or deficient in available moisture)
11	Dry Tops – Ridge tops with thin rock outcrops and considerable exposure to sun and wind.
12	Dry Slopes – Slopes with thin rock outcrops and considerable exposure to sun and wind. Includes most mountain/steep slopes with a southern or western exposure.
13	Deep Sands – Sites with a deep, sandy surface subject to rapid loss of moisture following precipitation. Typical examples include sand hills, ridges, and flats in the South, sites along the beach and shores of lakes and streams.
19	Other Xeric – All dry physiographic sites not described above.
	Mesic sites (normally moderate but adequate available moisture)
21	Flatwoods – Flat or fairly level sites outside of flood plains. Excludes deep sands and wet, swampy sites.
22	Rolling Uplands – Hills and gently rolling, undulating terrain and associated small streams. Excludes deep sands, all hydric sites, and streams with associated flood plains.
23	Moist Slopes and Coves – Moist slopes and coves with relatively deep, fertile soils. Often these sites have a northern or eastern exposure and are partially shielded from wind and sun. Includes moist mountain tops and saddles.
24	Narrow flood plains/Bottomlands – Flood plains and bottomlands less than 1/4-mile in width along rivers and streams. These sites are normally well drained but are subjected to occasional flooding during periods of heavy or extended precipitation. Includes associated levees, benches, and terraces within a 1/4 mile limit. Excludes swamps, sloughs, and bogs.
25	Broad Floodplains/Bottomlands – Floodplains and bottomlands ¼ mile or wider along rivers and streams. These sites are normally well drained but are subjected to occasional flooding during periods of heavy or extended precipitation. Includes associated levees, benches, and terraces. Excludes swamps, sloughs, and bogs with year-round water problems.
29	Other Mesic – All moderately moist physiographic sites not described above.
	Hydric sites (normally abundant or overabundant moisture all year)
31	Swamps/Bogs – Low, wet, flat, forested areas usually quite extensive that are flooded for long periods except during periods of extreme drought. Excludes cypress ponds and small drains.
32	Small Drains – Narrow, stream-like, wet strands of forest land often without a well-defined stream channel. These areas are poorly drained or flooded throughout most of the year and drain the adjacent higher ground.
33	Bays and wet pocosins – Low, wet, boggy sites characterized by peaty or organic soils. May be somewhat dry during periods of extended drought. Examples include sites in the Carolina bays in the Southeast United States.
34	Beaver ponds.

Code	Description
35	Cypress ponds.
39	Other hydric – All other hydric physiographic sites.

36. GSSTKCD Growing-stock stocking code. A code indicating the stocking of the condition by growing-stock trees, including seedlings. Growing-stock trees are those where tree class (TREE.TREECLCD) equals 2 or, for seedlings that do not have tree class assigned where species group (TREE.SPGRPCD) is not equal to 23 (woodland softwoods), 43 (eastern noncommercial hardwoods), and 48 (woodland hardwoods). Populated for all forest plots, and all NCRS periodic plots that were measured as "nonforest with trees" (e.g., wooded pasture, windbreaks). This attribute is blank (null) for periodic plots that are used only for growth, mortality and removal estimates, and modeling of reserved and unproductive conditions.

Estimates (e.g., forest land area, tree volume) associated with nonstocked areas identified with stocking code (GSSTKCD and ALSTKCD), stand-size class (STDSZCD and FLDSZCD), and forest type (FORTYPCDCALC, FORTYPCD, and FLDTYPCD) can differ. Stand-size class (STDSZCD) and forest type (FORTYPCD) use a field-crew recorded stand-size class (FLDSZCD) and forest type (FLDTYPCD) when a condition is less than 25 percent of the plot area (CONDPROP_UNADJ < 0.25); otherwise, stand-size class and forest type are assigned with an algorithm using trees tallied on the plot (see "National Algorithms for Determining Stocking Class, Stand Size Class, and Forest Type for Forest Inventory and Analysis Plots" at http://fia.fs.fed.us/library/sampling/docs/supplement4_121704.pdf). Stocking code and forest type code calculated (FORTYPCDCALC) also use the algorithm to assign stocking to every condition on the plot, regardless of condition size. When estimates include conditions less than 25 percent of the plot area, small differences among estimates can result when summarizing by stocking code or forest type code calculated versus stand-size class or forest type. Differences are expected between field crew and algorithm assignments; the field crew assigns stand-size class and forest type considering trees on and adjacent to the plot, while the algorithm only uses trees tallied on the plot.

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

Note: Some periodic survey data are in the form of an absolute stocking value (0-167). More detailed information on how stocking values were determined from plot data in a particular State can be obtained directly from the FIA work units (SURVEY.RSCD = 33).

Code	Description
1	Overstocked (130+%)
2	Fully stocked (100 – 129.9%)
3	Medium stocked (60 – 99.9%)
4	Poorly stocked (16.7 – 59.9%)
5	Nonstocked (<16.7%)

37. ALSTKCD All live stocking code. A code indicating the stocking of the condition by live trees, including seedlings. Data are in classes as listed for GSSTKCD above. May not be populated for some FIA work units when PLOT.MANUAL <1.0. Populated for all forest annual plots, all forest periodic plots, and all NCRS periodic plots that were measured as "nonforest with trees" (e.g., wooded pasture, windbreaks).

Estimates (e.g., forest land area, tree volume) associated with nonstocked areas identified with stocking code (GSSTKCD and ALSTKCD), stand-size class (STDSZCD and FLDSZCD), and forest type (FORTYPCDCALC, FORTYPCD, and FLDTYPCD) can differ. Stand-size class (STDSZCD) and forest type (FORTYPCD) use a field-crew recorded stand-size class (FLDSZCD) and forest type (FLDTYPCD) when a condition is less than 25 percent of the plot area (CONDPROP_UNADJ < 0.25); otherwise, stand-size class and forest type are assigned with an algorithm using trees tallied on the plot (see "National Algorithms for Determining Stocking Class, Stand Size Class, and Forest Type for Forest Inventory and Analysis Plots" at http://fia.fs.fed.us/library/sampling/docs/supplement4_121704.pdf). Stocking code and forest type code calculated (FORTYPCDCALC) also use the algorithm to assign stocking to every condition on the plot, regardless of condition size. When estimates include conditions less than 25 percent of the plot area, small differences among estimates can result when summarizing by stocking code or forest type code calculated versus stand-size class or forest type. Differences are expected between field crew and algorithm assignments; the field crew assigns stand-size class and forest type considering trees on and adjacent to the plot, while the algorithm only uses trees tallied on the plot.

Note: Some periodic survey data are in the form of an absolute stocking value (0-167). More detailed information on how stocking values were determined from plot data in a particular State can be obtained directly from the FIA work units (SURVEY.RSCD = 33).

38. DSTRBCD1 Disturbance 1 code. A code indicating the kind of disturbance occurring since the last measurement or within the last 5 years for new plots. The area affected by the disturbance must be at least 1 acre in size. A significant level of disturbance (mortality or damage to 25 percent of the trees in the condition) is required. Populated for all forested conditions using the National Field Guide protocols (PLOT.MANUAL ≥1.0) and populated by some FIA work units where PLOT.MANUAL <1.0. Codes 11, 12, 21, and 22 are valid where PLOT. MANUAL ≥2.0.

Code	Description
0	No visible disturbance
10	Insect Damage
11	Insect damage to understory vegetation
12	Insect damage to trees, including seedlings and saplings
20	Disease Damage
21	Disease damage to understory vegetation
22	Disease damage to trees, including seedlings and saplings
30	Fire damage (from crown and ground fire, either prescribed or natural)
31	Ground fire damage
32	Crown fire damage
40	Animal Damage
41	Beaver (includes flooding caused by beaver)
42	Porcupine
43	Deer/ungulate
44	Bear (CORE OPTIONAL)
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 or in the TREATMENT codes.
90	Geologic disturbances
91	Landslide
92	Avalanche track
93	Volcanic blast zone
94	Other geologic event
95	Earth movement / avalanches

39. DSTRBYR1 Disturbance year 1. Year in which Disturbance 1 is estimated to have occurred. If the disturbance occurs continuously over a period of time, the value 9999 is used. Populated for all forested conditions that have some disturbance using the National Field Guide protocols (PLOT.MANUAL ≥1.0) and populated by some FIA work units where PLOT.MANUAL <1.0. If DISTRBCD1 = 0 then DSTRBYR1 = blank (null) or 0.

40. DSTRBCD2 Disturbance 2 code. The second disturbance code, if the stand has experienced more than one disturbance. See DSTRBCD1 for more information. This attribute is new in annual inventory.

41. DSTRBYR2 Disturbance year 2. The year in which Disturbance 2 occurred. See DSTRBYR1 for more information. This attribute is new in annual inventory.

42. DSTRBCD3 Disturbance 3 code. The third disturbance code, if the stand has experienced more than two disturbances. See DSTRBCD1 for more information. This attribute is new in annual inventory.

43. DSTRBYR3 Disturbance year 3. The year in which Disturbance 3 occurred. See DSTRBYR1 for more information. This attribute is new in annual inventory.

44. TRTCD1 Treatment code 1. A code indicating the type of stand treatment that has occurred since the last measurement or within the last 5 years for new plots. The area affected by the treatment must be at least 1 acre in size. Populated for all forested conditions using the National Field Guide protocols (PLOT.MANUAL ≥1.0) and populated by some FIA work units where PLOT.MANUAL <1.0. When PLOT.MANUAL <1.0, inventories may record treatments occurring within the last 20 years for new plots.

Code	Description
00	No observable treatment
10	Cutting – The removal of one or more trees from a stand
20	Site preparation – Clearing, slash burning, chopping, disking, bedding, or other practices clearly intended to prepare a site for either natural or artificial regeneration
30	Artificial regeneration – Following a disturbance or treatment (usually cutting), a new stand where at least 50 percent of the live trees present resulted from planting or direct seeding
40	Natural regeneration – Following a disturbance or treatment (usually cutting), a new stand where at least 50 percent of the live trees present (of any size) were established through the growth of existing trees and/or natural seeding or sprouting
50	Other silvicultural treatment – The use of fertilizers, herbicides, girdling, pruning, or other activities (not 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

45. TRTYR1 Treatment year 1. Year in which Stand Treatment 1 is estimated to have occurred. Populated for all forested conditions that have some treatment using the National Field Guide protocols (PLOT.MANUAL ≥1.0) and populated by some FIA work units where PLOT.MANUAL <1.0. If TRTCD1 = 00 then TRTYR1 = blank (null) or 0.

46. TRTCD2 Treatment code 2. A code indicating the type of stand treatment that has occurred since the last measurement or within the last 5 years for new plots. See TRTCD1 for more information.

47. TRTYR2 Treatment year 2. Year in which Stand Treatment 2 is estimated to have occurred. See TRTYR1 for more information.

48. TRTCD3 Treatment code 3. A code indicating the type of stand treatment that has occurred since the last measurement or within the last 5 years for new plots. See TRTCD1 for more information.

49. TRTYR3 Treatment year 3. Year in which Stand Treatment 3 is estimated to have occurred. See TRTYR1 for more information.

50. PRESNFCD Present nonforest code. A code indicating the current nonforest land use for conditions that were previously classified as forest but are now classified as nonforest.
Note: This attribute is Core for FIADB 6.0, but for all prior annual inventories, it was Core for remeasured conditions that were forest before and are now nonforest, and Core optional for all conditions where current condition class status is nonforest, regardless of the previous condition.

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

51. BALIVE Basal area per acre of live trees. Basal area in square feet per acre of all live trees over 1 inch DBH/DRC sampled in the condition. Populated for all forested annual plots, all forested periodic plots, and all NCRS periodic plots that were measured as “nonforest with trees” (e.g., wooded pasture, windbreaks.) Not used in population estimates.

52. FLDAGE Field-recorded stand age. The stand age as assigned by the field crew. Based on the average total age, to the nearest year, of the trees in the field-recorded stand-size class of the condition, determined using local procedures. For non-stocked stands, 0 is stored. If all of the trees in a condition class are of a species that by regional standards cannot be bored for age (e.g., mountain mahogany, tupelo), 998 is recorded. If tree cores are not counted in the field, but are collected and sent to the office for the counting of rings, 999 is recorded.

53. ALSTK All-live-tree stocking percent. The sum of stocking percent values of all live trees on the condition. The percent is then assigned to a stocking class, which is found in ALSTKCD. May not be populated for some FIA work units when PLOT.MANUAL <1.0.

Note: Some periodic survey data are in the form of an absolute stocking value (0-167). More detailed information on how stocking values were determined from plot data in a particular State can be obtained directly from the FIA work units (SURVEY.RSCD = 33).

54. GSSTK — Growing-stock stocking percent. The sum of stocking percent values of all growing-stock trees on the condition. The percent is then assigned to a stocking class, which is found in GSSTKCD. May not be populated for some FIA work units when PLOT.MANUAL <1.0.

Note: Some periodic survey data are in the form of an absolute stocking value (0-167). More detailed information on how stocking values were determined from plot data in a particular State can be obtained directly from the FIA work units (SURVEY.RSCD = 33).

55. FORTYPCDCALC

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

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

FORTYPCDCALC is only used for computational purposes. It is a direct output from the algorithm, and is used to populate FORTYPCD when the condition is at least 25 percent of the plot area (CONDPROP_UNADJ>=.25). See also FORTYPCD and FLDTYPCD. Refer to appendix D for a complete list of forest type codes and names.

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

HABTYPCD1_PUB_CD and HABYTYPCD1_DESCR_PUB_CD). Only collected by certain FIA work units (SURVEY.RSCD = 22, 23, or 26).

57. HABTYPCD1_PUB_CD

Habitat type code 1 publication code. A code indicating the publication that lists the name for the habitat type code (HABTYPCD1). Publication information is documented in the REF_HABTYP_PUBLICATION table. Only used by certain FIA work units (SURVEY.RSCD = 22, 23, or 26).

58. HABTYPCD1_DESCR_PUB_CD

Habitat type code 1 description publication code. A code indicating the publication that gives a description for habitat type code 1 (HABTYPCD1). This publication may or may not be the same publication that lists the name of the habitat type (HABTYPCD1_PUB_CD). Publication information is documented in REF_HABTYP_PUBLICATION table. Only used by certain FIA work units (SURVEY.RSCD = 22, 23, or 26).

59. HABTYPCD2 Habitat type code 2. A code indicating the secondary habitat type (or community type) for this condition. Unique codes are determined by combining both habitat type code and publication code (HABTYPCD2 and HABTYPCD2_PUB_CD). Habitat type captures information about both the overstory and understory vegetation and usually describes the vegetation that is predicted to become established after all successional stages of the ecosystem are completed without any disturbance. This code can be translated using the publication in which it was named and described (see HABTYPCD2_PUB_CD and HABYTYPCD2_DESCR_PUB_CD). Only collected by certain FIA work units (SURVEY.RSCD = 22, 23, or 26).

60. HABTYPCD2_PUB_CD

Habitat type code 2 publication code. A code indicating the publication that lists the name for the habitat type code (HABTYPCD2). Publication information is documented in REF_HABTYP_PUBLICATION table. Only used by certain FIA work units (SURVEY.RSCD = 22, 23, or 26).

61. HABTYPCD2_DESCR_PUB_CD

Habitat type code 2 description publication code. A code indicating the publication that gives a description for habitat type code 2 (HABTYPCD2). This publication may or may not be the same publication that lists the name of the habitat type (HABTYPCD2_PUB_CD). Publication information is documented in REF_HABTYP_PUBLICATION table. Only used by certain FIA work units (SURVEY.RSCD = 22, 23, or 26).

62. MIXEDCONFCD

Mixed conifer site code. An indicator to show that the forest condition is a mixed conifer site in California. These sites are a complex association of ponderosa pine, sugar pine, Douglas-fir, white fir, red fir, and/or incense-cedar. Mixed conifer sites use a specific site index equation. This is a yes/no attribute. This attribute is left blank (null) for all other States. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Description
Y	Yes, the condition is a mixed conifer site in California
N	No, the condition is not a mixed conifer site in California

63. VOL_LOC_GRP

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

Code	Description
S22LAZN	Northern Arizona Ecosections
S22LAZS	Southern Arizona Ecosections
S22LCOE	Eastern Colorado Ecosections
S22LCOW	Western Colorado Ecosections
S22LID	Idaho Ecosections
S22LMTE	Eastern Montana Ecosections
S22LMTW	Western Montana Ecosections
S22LNV	Nevada Ecosections
S22LNMN	Northern New Mexico Ecosections
S22 LNMS	Southern New Mexico Ecosections
S22LUTNE	Northern & Eastern Utah Ecosections
S22LUTSW	Southern & Western Utah Ecosections
S22LWYE	Eastern Wyoming Ecosections
S22LWYW	Western Wyoming Ecosections
S23LCS	Central States (IL, IN, IA, MO)
S23LLS	Lake States (MI, MN, WI)
S23LPS	Plains States (KS, NE, ND, SD)
S24	Northeastern States (CT, DE, ME, MD, MA, NH, NJ, NY, OH, PA, RI, VT, WV)
S26LCA	California other than mixed conifer forest type
S26LCAMIX	California mixed conifer forest type
S26LEOR	Eastern Oregon
S26LEWA	Eastern Washington
S26LORJJ	Oregon Jackson and Josephine Counties
S26LWOR	Western Oregon
S26LWWA	Western Washington
S26LWACF	Washington Silver Fir Zone
S27LAK1A	Coastal Alaska Southeast

Code	Description
S27LAK1AB	Coastal Alaska Southeast and Central
S27LAK1B	Coastal Alaska Central
S27LAK1C	Coastal Alaska Kodiak and Afognak Islands
S33	Southern Research States (excluding Puerto Rico and the Virgin Islands) – AL, AR, FL, GA, LA, KY, MS, OK, NC, SC, TN, TX, VA
S33PRVI	Puerto Rico and Virgin Islands

64. SITECLCDEST

Site productivity class code estimated. This is a field-recorded code that is an estimated or predicted indicator of site productivity. It is used as the value for SITECLCD if no valid site tree is available. When SITECLCDEST is used as SITECLCD, SITECL_METHOD is set to 6. For data stored in the database that were processed prior to the use of NIMS, this variable is blank (null). Only collected by certain FIA work units (SURVEY.RSCD = 23, 24, 26, 27 or 33).

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

65. SITETREE_TREE

Site tree tree number. If an individual site index tree is used to calculate SICOND, this is the tree number of the site tree (SITETREE.TREE column) used. Only collected by certain FIA work units (SURVEY.RSCD = 23 or 33).

66. SITECL_METHOD

Site class method. A code identifying the method for determining site index or estimated site productivity class. Populated for annual inventory and may be populated for periodic inventory.

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

67. CARBON_DOWN_DEAD

Carbon in down dead. Carbon (tons per acre) of woody material >3 inches in diameter on the ground, and stumps and their roots >3 inches in diameter. Estimated from models based on geographic area, forest type, and live tree carbon density (Smith and Heath 2008). This modeled attribute is a component of the EPA's Greenhouse Gas Inventory and is not a direct sum of Phase 2 or Phase 3 measurements. This is a per acre estimate and must be multiplied by COND.CONDPROP_UNADJ and the appropriate expansion and adjustment factor located in the POP_STRATUM table.

68. CARBON_LITTER

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

69. CARBON_SOIL_ORG

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

70. CARBON_STANDING_DEAD

Carbon in standing dead. Carbon (tons per acre) in standing dead trees, including coarse roots, is estimated from models based on geographic area, forest type, and (except for nonstocked stands) growing-stock volume (Smith and Heath 2008). This modeled variable is a component of the EPA's Greenhouse Gas Inventory and is not a direct sum of Phase 2 or Phase 3 measurements. For most users it is preferable to calculate carbon (tons per acre) for annual inventories from the Phase 2 tree data. This is a per acre estimate and must be multiplied by COND.CONDPROP_UNADJ and the appropriate expansion and adjustment factor located in the POP_STRATUM table.

71. CARBON_UNDERSTORY_AG

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

72. CARBON_UNDERSTORY_BG

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

73. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

74. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

75. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

76. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

77. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

78. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

79. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

80. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

81. SOIL_ROOTING_DEPTH_PNW

Soil rooting depth, Pacific Northwest Research Station. Describes the soil depth (the depth to which tree roots can penetrate) within each forest land condition class. Required for all forest condition classes. This variable is coded 1 when more than half of area in the condition class is estimated to be ≤20 inches deep. Ground pumice, decomposed granite, and sand all qualify as types of soil. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Description
1	≤20 inches
2	>20 inches

82. GROUND_LAND_CLASS_PNW

Present ground land class, Pacific Northwest Research Station. A refinement of forest land that distinguishes timberland and a variety of forest land types. Each code, and corresponding ground land class (GLC) name and description are listed. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Description
120	Timberland – Forest land that is potentially capable of producing at least 20 cubic feet/acre/year at culmination in fully stocked, natural stands (1.4 cubic meters/hectare/year) of continuous crops of trees to industrial roundwood size and quality. Industrial roundwood requires species that grow to size and quality adequate to produce lumber and other manufactured products (exclude fence posts and fuel wood that are not considered manufactured). Timberland is characterized by no severe limitations on artificial or natural restocking with species capable of producing industrial roundwood.
141	Other forest rocky – Other forest land that can produce tree species of industrial roundwood size and quality, but that is unmanageable because the site is steep, hazardous, and rocky, or is predominantly nonstockable rock or bedrock, with trees growing in cracks and pockets. Other forest-rocky sites may be incapable of growing continuous crops due to inability to obtain adequate regeneration success.
142	Other forest unsuitable site (wetland, subalpine, or coastal conifer scrub; California only) – Other forest land that is unsuited for growing industrial roundwood because of one of the following environment factors: willow bogs, spruce bogs, sites with high water tables or even standing water for a portion of the year, and harsh sites due to extreme climatic and soil conditions. Trees present are often extremely slow growing and deformed. Examples: whitebark pine, lodgepole, or mountain hemlock stands at timberline; shore pine along the sparkling blue Pacific Ocean (Monterey, Bishop, and Douglas-fir); willow wetlands with occasional cottonwoods present; Sitka spruce-shrub communities bordering tidal flats and channels along the coast. Includes aspen stands in high-desert areas or areas where juniper/mountain mahogany are the predominant species.
143	Other forest pinyon-juniper – Areas currently capable of 10 percent or more tree stocking with forest trees, with juniper species predominating. These areas are not now, and show no evidence of ever having been10 percent or more stocked with trees of industrial roundwood form and quality. Stocking capabilities indicated by live juniper trees or juniper stumps and juniper snags less than 25 years dead or cut. Ten percent juniper stocking means 10 percent crown cover at stand maturity. For woodland juniper species, ten percent stocking means 5 percent crown cover at stand maturity.
144	Other forest-oak (formally oak woodland) – Areas currently 10 percent or more stocked with forest trees, with low quality forest trees of oak, gray pine, madrone, or other hardwood species predominating, and that are not now, and show no evidence of ever having been 10 percent or more stocked with trees of industrial

Code	Description
	roundwood form and quality. Trees on these sites are usually short, slow growing, gnarled, poorly formed, and generally suitable only for fuel wood. The following types are included: blue oak, white oak, live oak, oak-gray pine.
146	Other forest unsuitable site (Oregon and Washington only) – Other forest land that is unsuited for growing industrial roundwood because of one of the following environment factors: willow bogs, spruce bogs, sites with high water tables or even standing water for a portion of the year, and harsh sites due to climatic conditions. Trees present are often extremely slow growing and deformed. Examples: whitebark pine or mountain hemlock stands at timberline, shore pine along the Pacific Ocean, willow wetlands with occasional cottonwoods present, and Sitka spruce-shrub communities bordering tidal flats and channels along the coast. Aspen stands in high-desert areas or areas where juniper/mountain mahogany are the predominant species are considered other forest-unsuitable site.
148	Other forest-Cypress (California only) – Forest land with forest trees with cypress predominating. Shows no evidence of having had 10 percent or more cover of trees of industrial roundwood quality and species.
149	Other forest-Low Productivity (this code is calculated in the office) – Forestland capable of growing crops of trees to industrial roundwood quality, but not able to grow wood at the rate of 20 cubic feet/acre/year. Included are areas of low stocking potential and/or very low site index.
150	Other forest curlleaf mountain mahogany – Areas currently capable of 10 percent or more tree stocking with forest trees, with curlleaf mountain mahogany species predominating. These areas are not now, and show no evidence of ever having been 10 percent or more stocked with trees of industrial roundwood form and quality; 10 percent mahogany stocking means 5 percent crown cover at stand maturity.

83. PLANT_STOCKABILITY_FACTOR_PNW

Plant stockability factor, Pacific Northwest Research Station. Some plots in PNWRS have forest land condition classes that are low site, and are incapable of attaining normal yield table levels of stocking. For such classes, potential productivity (mean annual increment at culmination) must be discounted. Most forested conditions have a default value of 1 assigned; those conditions that meet the low site criteria have a value between 0.1 and 1. Key plant indicators and plant communities are used to assign discount factors, using procedures outlined in MacLean and Bolsinger (1974) and Hanson and others (2002). Only collected by certain FIA work units (SURVEY.RSCD = 26).

84. STND_COND_CD_PNWRS

Stand condition code, Pacific Northwest Research Station. A code that best describes the condition of the stand within forest condition classes. Stand condition is defined here as " the size, density, and species composition of a plant community following disturbance and at various time intervals after disturbance." Information on stand condition is used in describing wildlife habitat. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Stand Condition	Definition
0	Not applicable	Condition class is juniper, chaparral, or curlleaf mountain mahogany forest type.
1	Grass-forb	Shrubs <40 percent crown cover and <5 feet tall; plot may range from being largely devoid of vegetation to dominance by herbaceous species (grasses and forbs); tree regeneration generally <5 feet tall and 40 percent cover.
2	Shrub	Shrubs 40 percent crown canopy or greater, of any height; trees <40 percent crown canopy and <1.0 inch DBH/DRC. When average stand diameter exceeds 1.0 inch DBH/DRC, plot is "open sapling" or "closed sapling."

Code	Stand Condition	Definition
3	Open sapling, poletimber	Average stand diameter 1.0-8.9 inches DBH/DRC, and tree crown canopy poletimber <60 percent.
4	Closed sapling, pole, sawtimber	Average stand diameter is 1.0-21.0 inches DBH/DRC and crown cover is 60 percent or greater.
5	Open sawtimber	Average stand diameter is 9.0-21.0 inches DBH/DRC, and crown cover is <60 percent.
6	Large sawtimber	Average stand diameter exceeds 21.0 inches DBH/DRC; crown cover may be <100 percent; decay and decadence required for old-growth characteristics is generally lacking, successional trees required by old-growth may be lacking, and dead and down material required by old-growth is lacking.
7	Old-growth	Average stand diameter exceeds 21.0 inches DBH/DRC. Stands over 200 years old with at least two tree layers (overstory and understory), decay in living trees, snags, and down woody material. Some of the overstory layer may be composed of long-lived successional species (e.g., Douglas-fir, western redcedar).

85. STND_STRUC_CD_PNWRS

Stand structure code, Pacific Northwest Research Station. A code indicating the best overall structure of the stand. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Stand Structure	Definition
1	Even-aged single-storied	A single even canopy characterizes the stand. The greatest numbers of trees are in a height class represented by the average height of the stand; there are substantially fewer trees in height classes above and below this mean. The smaller trees are usually tall spindly members that have fallen behind their associates. The ages of trees usually do not differ by more than 20 years.
2	Even-aged two-storied	Stands composed of two distinct canopy layers, such as, an overstory with an understory sapling layer possibly from seed tree and shelterwood operations. This may also be true in older plantations, where shade-tolerant trees may become established. Two relatively even canopy levels can be recognized in the stand. Understory or overtopped trees are common. Neither canopy level is necessarily continuous or closed, but both canopy levels tend to be uniformly distributed across the stand. The average age of each level differs significantly from the other.
3	Uneven-aged	Theoretically, these stands contain trees of every age on a continuum from seedlings to mature canopy trees. In practice, uneven-aged stands are characterized by a broken or uneven canopy layer. Usually the largest number of trees is in the smaller diameter classes. As trees increase in diameter, their numbers diminish throughout the stand. Many times, instead of producing a negative exponential distribution of diminishing larger diameters, uneven-aged stands behave irregularly with waves of reproduction and mortality. Consider any stand with three or more structural layers as uneven-aged. Logging disturbances (examples are selection, diameter limit, and salvage cutting) will give a stand an uneven-aged structure.
4	Mosaic	At least two distinct size classes are represented and these are not uniformly distributed but are grouped in small repeating aggregations, or occur as stringers <120 feet wide, throughout the stand. Each size class aggregation is too small to be recognized and mapped as an individual stand. The aggregations may or may not be even-aged.

86. STUMP_CD_PNWRS

Stump code, Pacific Northwest Research Station. A yes/no attribute indicating whether or not stumps are present on a condition. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Description
Y	Yes, evidence of cutting or management exists; stumps are present
N	No, evidence of cutting was not observed; stumps are not present

87. FIRE_SRS

Fire, Southern Research Station. The presence or absence of fire on the condition since the last survey or within the last 5 years on new/replacement plots. Evidence of fire must occur within the subplot. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
0	No evidence of fire since last survey
1	Evidence of burning (either prescribed or wildfire)

88. GRAZING_SRS

Grazing, Southern Research Station. The presence or absence of domestic animal grazing on the condition since the last survey or within the last 5 years on new/replacement plots. Evidence of grazing must occur within the subplot. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
0	No evidence of livestock use (by domestic animals)
1	Evidence of grazing (including dung, tracks, trails, etc.)

89. HARVEST_TYPE1_SRS

Harvest type code 1, Southern Research Station. This variable is populated when the corresponding variable TRTCD = 10. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
11	Clearcut harvest – The removal of the majority of the merchantable trees in a stand; residual stand stocking is under 50 percent.
12	Partial harvest – Removal primarily consisting of highest quality trees. Residual consists of lower quality trees because of high grading or selection harvest. (e.g., uneven aged, group selection, high grading, species selection)
13	Seed-tree/shelterwood harvest – Crop trees are harvested leaving seed source trees either in a shelterwood or seed tree. Also includes the final harvest of the seed trees.
14	Commercial thinning – The removal of trees (usually poletimber sized) from poletimber-sized stands leaving sufficient stocking of growing-stock trees to feature in future stand development. Also included are thinning in sawtimber-sized stands where poletimber-sized (or log-sized) trees have been removed to improve quality of those trees featured in a final harvest.
15	Timber Stand Improvement (cut trees only) – The cleaning, release or other stand improvement involving non-commercial cutting applied to an immature stand that leaves sufficient stocking.
16	Salvage cutting – The harvesting of dead or damaged trees or of trees in danger of being killed by insects, disease, flooding, or other factors in order to save their economic value.

90. HARVEST_TYPE2_SRS

Harvest type code 2, Southern Research Station. See HARVEST_TYPE1_SRS.

91. HARVEST_TYPE3_SRS

Harvest type code 3, Southern Research Station. See HARVEST_TYPE1_SRS.

92. LAND_USE_SRS

Land use, Southern Research Station. A classification indicating the present land use of the condition. Collected on all condition records where SURVEY.RSCD = 33 and PLOT.DESIGNCD = 1, 230, 231, 232, or 233, and were processed in NIMS. It may not be populated for other SRS plot designs or for SRS data that have not been processed in NIMS. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
01	Timber land (COND.SITECLCD = 1, 2, 3, 4, 5, or 6).
02	Other forest land (COND.SITECLCD = 7).
10	Agricultural land – Land managed for crops, pasture, or other agricultural use and is not better described by one of the following detailed codes. The area must be at least 1.0 acre in size and 120.0 feet wide. Note: Codes 14, 15 and 16 are collected only where PLOT.MANUAL ≥1. If PLOT.MANUAL <1, then codes 14 and 15 were coded 11. There was no single rule for coding maintained wildlife openings where PLOT.MANUAL <1, so code 16 may have been coded 10, 11 or 12.
11	Cropland.
12	Pasture (improved through cultural practices).
13	Idle farmland.
14	Orchard.
15	Christmas tree plantation.
16	Maintained wildlife openings.
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 and is not better described by one of the following detailed codes. Note: Code 30 is used to describe all developed land where PLOT.MANUAL <1. The following detailed codes only apply to PLOT.MANUAL ≥1.
31	Cultural: business, 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 that do not fall into one of the uses described above or below.
41	Marsh.
42	Wetland.
43	Beach.
45	Nonforest-Chaparral.
91	Census Water – Lakes, reservoirs, ponds, and similar bodies of water 4.5 acres in size and larger; and rivers, streams, canals, etc., 30 to 200 feet wide.
92	Noncensus water – Lakes, reservoirs, ponds, and similar bodies of water 1.0 acre to 4.5 acres in size.

Code	Description
	Rivers, streams, canals, etc., more than 200 feet wide.
99	Nonsampled – Condition not sampled (see COND.COND_NONSAMPLE_REASN_CD for exact reason).

93. OPERABILITY_SRS

Operability, Southern Research Station. The viability of operating logging equipment in the vicinity of the condition. The code represents the most limiting class code that occurs on each forest condition. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
0	No problems
1	Seasonal access due to water conditions in wet weather
2	Mixed wet and dry areas typical of multi-channeled streams punctuated with dry islands
3	Broken terrain, cliffs, gullies, outcroppings, etc. that would severely limit equipment, access or use
4	Year-round water problems (includes islands)
5	Slopes 20-40 percent
6	Slope greater than 40 percent

94. STAND_STRUCTURE_SRS

Stand structure, Southern Research Station. The description of the predominant canopy structure for the condition. Only the vertical position of the dominant and codominant trees in the stand are considered. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
0	Non-stocked – The condition is less than 10 percent stocked.
1	Single-storied – Most of the dominant/codominant tree crowns form a single canopy (i.e., most of the trees are approximately the same height).
2	Two-storied – The dominant/codominant tree crowns form two distinct canopy layers or stories.
3	Multi-storied – More than two recognizable levels characterize the crown canopy. Dominant/codominant trees of many sizes (diameters and heights) for a multilevel canopy.

95. NF_COND_STATUS_CD

Nonforest condition status code. A code indicating the sampling status of the condition class.

Code	Description
2	Accessible nonforest land
5	Nonsampled nonforest

96. NF_COND_NONSAMPLE_REASN_CD

Nonforest condition nonsampled reason code. For portions of plots that are nonforest and cannot be sampled, one of the following reasons is recorded.

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

97. CANOPY_CVR_SAMPLE_METHOD_CD

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

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

98. LIVE_CANOPY_CVR_PCT

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

99. LIVE_MISSING_CANOPY_CVR_PCT

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

100. NBR_LIVE_STEMS

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

101. OWNSUBCD Owner subclass code. (Core optional for accessible forestland). A code that further subdivides the owner class into detailed subcategories. Currently there are subclasses for only the State category.

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

102. INDUSTRIALCD_FIADB

Industrial code in FIADB. A code indicating the status of the owner with regard to their objectives towards commercial timber production. This attribute is new in FIADB 6.0. Industrial lands are of sufficient size to produce a continual flow of timberland, and are owned by companies, organizations, and individuals who engage in commercially-oriented forest management activities, such as harvesting, thinning, and planting.

Code	Description
0	Non-industrial
1	Industrial

103. RESERVCD_5

Reserve code field. A code indicating the reserved designation for the condition at the time of the field survey. This attribute is new in FIADB 6.0, and is used to account for a change in the application of the definition of RESERVCD. In PLOT.MANUAL<6.0, publicly-owned land was considered reserved only if it was withdrawn by law(s) prohibiting the management of land for the production of wood products. Conditions measured prior to PLOT.MANUAL = 6.0 may have different values in RESERVCD and RESERVCD_5 due to changes in the application of the RESERVCD definition. RESERVCD_5 holds the reserved status associated with the previous definition of RESERVCD. Only populated for PLOT.MANUAL ≥1.0 and PLOT.MANUAL <6.0.

Code	Description
0	Not reserved
1	Reserved

104. ADMIN_WITHDRAWN_CD

Administratively withdrawn code. (*Core optional*) A code indicating whether or not a condition has an administratively withdrawn designation. 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.

Code	Description
0	Not administratively withdrawn
1	Administratively withdrawn

105. CHAINING_CD

Chaining code. A code indicating that 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.

Code	Description
0	No
1	Yes

106. LAND_COVER_CLASS_CD

Land cover class. A code indicating the type of land cover for a condition that meets the minimum area and width requirements (except those cases where the condition has been solely defined due to developed land uses, such as roads and rights-of-way). If the condition was less than 1 acre, a land cover classification key was used to assign a land cover class.

Codes are >10% vegetative cover:

Code	Description
01	**Treeland**: Areas on which trees provide 10% or greater canopy cover and are part of the dominant (uppermost) vegetation layer, including areas that have been planted to produce woody crops. Only tree species that can be tallied in the region are considered. 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.
02	**Shrubland:** Areas on which shrubs or subshrubs provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer, provided these areas do not qualify as Treeland. **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 and other shrub-dominated wetlands, chaparral, and sagebrush.
03	**Grassland:** Areas on which herbaceous vegetation provide 10% or greater cover and are part of the dominant (uppermost) vegetation layer, provided these areas do not qualify as Treeland or Shrubland. This includes herbs, forbs, and graminoid species. Examples include meadows and prairies. Grazed land is also included, but not if the pasture is improved to such an extent that it meets the requirements for Agricultural Vegetation. This category also includes emergent wetland vegetation like seasonally flooded grasslands, cattail marshes, etc.
04	**Non-vascular Vegetation:** Areas on which non-vascular vegetation provide 10% or greater cover and are part of the dominant vegetation layer, provided these areas do not qualify as Treeland, Shrubland, or Grassland. Examples include mosses, sphagnum moss bogs, liverworts, hornworts, lichens, and algae.
05	**Mixed Vegetation:** Areas with 10% or greater vegetative cover but no one life form has 10% or more cover. That is, these areas do not qualify as Treeland, Shrubland, Grassland, or Non-vascular Vegetation, and thus are a mixture of plant life forms. Examples can include early stages of reverting fields and high deserts,

Code	Description
06	**Agricultural Vegetation:** Areas that are dominated by vegetation grown for the production of crops (food, non-woody fiber and/or ornamental horticulture), including land in any stage of annual crop production, and land being regularly cultivated for production of crops from perennial plants. Agricultural vegetation shows a) rapid turnover in structure, typically at least on an annual basis, either through harvesting and/or planting, or by continual removal of above ground structure (e.g., cutting, haying, or intensive grazing), or b) showing strong linear (planted) features. The herbaceous layer may be bare at various times of the year (NVCS 2008). Examples include row crops and closely sown crops; sod farms, hay and silage crops; orchards (tree fruits and nuts, Christmas trees, nurseries of trees and shrubs), small fruits, and berries; vegetables and melons; unharvested crops; cultivated or improved pasture; idle cropland (can include land in cover and soil-improvement crops and cropland on which no crops were planted) (NRI Field guide). When idle or fallow land ceases to be predominantly covered with manipulated vegetation, then it is no longer Agricultural Vegetation.
07	**Developed, Vegetated:** Areas predominantly covered by vegetation with highly-manipulated growth forms (usually by mechanical pruning, mowing, clipping, etc.), but are not Agricultural. This vegetation type typically contains an almost continuous herbaceous (typically grass) layer, with a closely cropped physiognomy, typically through continual removal of above ground structure (e.g., cutting, mowing), and where tree cover is highly variable, or other highly manipulated planted gardens (NVCS 2008). Examples can include lawns, maintained utility rights-of-way, office parks, and cemeteries.

Codes are < 10% cover

Code	Description
08	**Barren:** Natural areas of limited plant life (< 10%). Areas generally characterized by bare rock, gravel, sand, silt, clay, or other earthen material, with little or no "green" vegetation present regardless of its inherent ability to support life. Examples include naturally barren areas such as lava fields, gravel bars and sand dunes, as well as areas where land clearance has removed the vegetative cover. Can include the natural material portions of quarries, mines, gravel pits, and cut or burned land <10% vegetation.
09	**Developed:** Areas predominantly covered with constructed materials with limited plant life (< 10%). Examples include completely paved surfaces like roads, parking lots and densely developed urban areas.
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.

107. AFFORESTATION_CD

Current afforestation code. A code indicating 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.

Code	Description
0	No
1	Yes

108. PREV_AFFORESTATION_CD

Previous afforestation code. A code indicating 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.

Code	Description
0	No
1	Yes

Subplot Table (Oracle table name is SUBPLOT)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	PREV_SBP_CN	Previous subplot sequence number	VARCHAR2(34)
4	INVYR	Inventory year	NUMBER(4)
5	STATECD	State code	NUMBER(4)
6	UNITCD	Survey unit code	NUMBER(2)
7	COUNTYCD	County code	NUMBER(3)
8	PLOT	Phase 2 plot number	NUMBER(5)
9	SUBP	Subplot number	NUMBER(3)
10	SUBP_STATUS_CD	Subplot/macroplot status code	NUMBER(1)
11	POINT_NONSAMPLE_REASN_CD	Point nonsampled reason code	NUMBER(2)
12	MICRCOND	Microplot center condition	NUMBER(1)
13	SUBPCOND	Subplot center condition	NUMBER(1)
14	MACRCOND	Macroplot center condition	NUMBER(1)
15	CONDLIST	Subplot/macroplot condition list	NUMBER(4)
16	SLOPE	Subplot slope	NUMBER(3)
17	ASPECT	Subplot aspect	NUMBER(3)
18	WATERDEP	Snow/water depth	NUMBER(2,1)
19	P2A_GRM_FLG	Periodic to annual growth, removal, and mortality flag	VARCHAR2(1)
20	CREATED_BY	Created by	VARCHAR2(30)
21	CREATED_DATE	Created date	DATE
22	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
23	MODIFIED_BY	Modified by	VARCHAR2(30)
24	MODIFIED_DATE	Modified date	DATE
25	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
26	CYCLE	Inventory cycle number	NUMBER(2)
27	SUBCYCLE	Inventory subcycle number	NUMBER(2)
28	ROOT_DIS_SEV_CD_PNWRS	Root disease severity rating code, Pacific Northwest Research Station	NUMBER(1)
29	NF_SUBP_STATUS_CD	Nonforest subplot status code	NUMBER(1)
30	NF_SUBP_NONSAMPLE_REASN_ CD	Nonforest subplot nonsampled reason code	NUMBER(2)
31	P2VEG_SUBP_STATUS_CD	P2 vegetation subplot status code	NUMBER(1)
32	P2VEG_SUBP_NONSAMPLE_REASN_ CD	P2 vegetation subplot nonsampled reason code	NUMBER(2)
33	INVASIVE_SUBP_STATUS_CD	Invasive subplot status code	NUMBER(1)
34	INVASIVE_NONSAMPLE_REASN_CD	Invasive nonsampled reason code	NUMBER(2)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	SBP_PK
Unique	PLT_CN, SUBP	N/A	SBP_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, SUBP	N/A	SBP_NAT_I
Foreign	PLT_CN, SUBPCOND	SUBPLOT to COND	SBP_CND_FK
Foreign	PLT_CN, MICRCOND	SUBPLOT to COND	SBP_CND_FK2
Foreign	PLT_CN, MACRCOND	SUBPLOT to COND	SBP_CND_FK3
Foreign	PLT_CN	SUBPLOT to PLOT	SBP_PLT_FK

Note: The SUBPLOT record may not exist for some periodic inventory data.

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

2. PLT_CN — Plot sequence number. Foreign key linking the subplot record to the plot record.

3. PREV_SBP_CN

   Previous subplot sequence number. Foreign key linking the subplot record to the previous inventory's subplot record for this subplot. Only populated on annual remeasured plots.

4. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

8. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

9. SUBP — Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

10. SUBP_STATUS_CD

Subplot/macroplot status code. A code indicating whether forest land was sampled on the subplot/macroplot or not. May be blank (null) in periodic inventories and where SUBP >4.

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

11. POINT_NONSAMPLE_REASN_CD

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

Code	Description
01	Outside U.S. boundary – Entire subplot (or macroplot) is outside of the U.S. border.
02	Denied access area – Access to the entire subplot (or macroplot) is denied by the legal owner, or by the owner of the only reasonable route to the subplot (or macroplot).
03	Hazardous situation – Entire subplot (or macroplot) cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc.
04	Time limitation – Entire subplot (or macroplot) cannot be sampled due to a time restriction. This code is reserved for areas with limited access, and in situations where it is imperative for the crew to leave before the plot can be completed (e.g., scheduled helicopter rendezvous).
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.
06	Lost plot – Entire plot cannot be found. Used for the four subplots that are required for this plot.
07	Wrong location – Previous plot can be found, but its placement is beyond the tolerance limits for plot location. Used for the four subplots that are required for this plot.
08	Skipped visit – Entire plot skipped. Used for plots that are not completed prior to the time a panel is finished and submitted for processing. Used for the four subplots that are required for this plot. This code is for office use only.
09	Dropped intensified plot - Intensified plot dropped due to a change in grid density. Used for the four subplots that are required for this plot. This code used only by units engaged in intensification. This code is for office use only.
10	Other – Entire subplot (or macroplot) not sampled due to a reason other than one of the specific reasons already listed.
11	Ocean – Subplot/macroplot falls in ocean water below mean high tide line.

12. MICRCOND Microplot center condition. Condition number for the condition at the center of the microplot.

13. SUBPCOND Subplot center condition. Condition number for the condition at the center of the subplot.

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

15. CONDLIST Subplot/macroplot condition list. (*Core optional*) This is a listing of all condition classes located within the 24.0/58.9-foot radius around the subplot/macroplot center. A maximum of four conditions is permitted on any

individual subplot/macroplot. For example: 2300 means these conditions (conditions 2 and 3) are on the subplot/macroplot.

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

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

18. WATERDEP — Snow/water depth. The approximate depth in feet of water or snow covering the subplot. Populated for all forested subplots using the National Field Guide protocols (PLOT.MANUAL ≥1.0) and populated by some FIA work units where PLOT.MANUAL <1.0. Not collected for certain FIA work units in 1999 (SURVEY.RSCD =23 and 24).

19. P2A_GRM_FLG

    Periodic to annual growth, removal, and mortality flag. A code indicating if this subplot is part of a periodic inventory (usually from a variable-radius plot design) that is only included for the purposes of computing growth, removals and/or mortality estimates. Tree data associated with this subplot does not contribute to current estimates of such attributes as volume, biomass or number of trees. The flag is set to Y for those subplots that are needed for estimation and otherwise is left blank (null).

20. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

21. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

22. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

23. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

24. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

25. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

26. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

27. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

28. ROOT_DIS_SEV_CD_PNWRS

    Root disease severity rating code, Pacific Northwest Research Station. The root disease severity rating that describes the degree of root disease present. Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Description
0	No evidence of root disease visible within 50 feet of the 58.9 foot macroplot.
1	Root disease present within 50 feet of the macroplot, but no evidence of disease on the macroplot.
2	Minor evidence of root disease on the macroplot, such as suppressed tree killed by root disease, or a minor part of the overstory showing symptoms of infection. Little or no detectable reduction in canopy closure or volume.
3	Canopy reduction evident, up to 20 percent; usually as a result of death of 1 codominant tree on an otherwise fully stocked site. In absence of mortality, numerous trees showing symptoms of root disease infection.
4	Canopy reduction at least 20 percent; up to 30 percent as a result of root disease mortality. Snags and downed trees removed from canopy by disease as well as live trees with advance symptoms of disease contribute to impact.
5	Canopy reduction 30-50 percent as a result of root disease. At least half of the ground area of macroplot considered infested with evidence of root disease-killed trees. Macroplots representing mature stands with half of their volume in root disease-tolerant species usually do not go much above severity 5 because of the ameliorating effect of the disease-tolerant trees.
6	50-75 percent reduction in canopy with most of the ground area considered infested as evidenced by symptomatic trees. Much of the canopy variation in this category is generally a result of root disease-tolerant species occupying infested ground.
7	At least 75 percent canopy reduction. Macroplots that reach this severity level usually are occupied by only the most susceptible species. There are very few of the original overstory trees remaining although infested ground is often densely stocked with regeneration of susceptible species.
8	The entire macroplot falls within a definite root disease pocket with only one or very few susceptible overstory trees present.
9	The entire macroplot falls within a definite root disease pocket with no overstory trees of the susceptible species present.

29. NF_SUBP_STATUS_CD

    Nonforest subplot/macroplot status code. A code describing the sampling status of the other-than-forest subplot.

Code	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

30. NF_SUBP_NONSAMPLE_REASN_CD

Nonforest subplot nonsampled reason code. For entire nonforest subplots that cannot be sampled, one of the following codes is recorded.

Code	Description
02	Denied access – A subplot/macroplot to which access is denied by the legal owner, or to which an owner of the only reasonable route to the plot denies access. Because a denied-access subplot can become accessible in the future, it remains in the sample and is re-examined at the next occasion to determine if access is available.
03	Hazardous situation – A subplot/macroplot that cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, temporary high water, etc. Although the hazard is not likely to change over time, a hazardous condition remains in the sample and is re-examined at the next occasion to determine if the hazard is still present.
04	Time limitation – This code applies to 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.

31. P2VEG_SUBP_STATUS_CD

P2 vegetation subplot status code. A code indicating if the subplot was sampled for P2 vegetation.

Code	Description
1	Subplot sampled for P2 vegetation
2	Subplot not sampled for P2 vegetation

32. P2VEG_SUBP_NONSAMPLE_REASN_CD

P2 vegetation subplot nonsampled reason code. A code indicating why vegetation on a subplot could not be sampled.

Code	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)

33. INVASIVE_SUBP_STATUS_CD

Invasive subplot status code. A code indicating if the subplot was sampled for invasive plants.

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

34. INVASIVE_NONSAMPLE_REASN_CD

Invasive nonsampled reason code. A code indicating why a subplot could not be sampled for invasive plants.

Code	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)

Subplot Condition Table (Oracle table name is SUBP_COND)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	UNITCD	Survey unit code	NUMBER(2)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER(5)
8	SUBP	Subplot number	NUMBER(3)
9	CONDID	Condition class number	NUMBER(1)
10	CREATED_BY	Created by	VARCHAR2(30)
11	CREATED_DATE	Created date	DATE
12	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
13	MODIFIED_BY	Modified by	VARCHAR2(30)
14	MODIFIED_DATE	Modified date	DATE
15	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
16	MICRCOND_PROP	Microplot-condition proportion	NUMBER(5,4)
17	SUBPCOND_PROP	Subplot-condition proportion	NUMBER(5,4)
18	MACRCOND_PROP	Macroplot-condition proportion	NUMBER(5,4)
19	NONFR_INCL_PCT_SUBP	Nonforest inclusions percentage of subplot	NUMBER(3)
20	NONFR_INCL_PCT_MACRO	Nonforest inclusions percentage of macroplot	NUMBER(3)
21	CYCLE	Inventory cycle number	NUMBER(2)
22	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	SCD_PK
Unique	PLT_CN, SUBP, CONDID	N/A	SCD_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, SUBP, CONDID	N/A	SCD_NAT_I
Foreign	PLT_CN, CONDID	SUBP_COND to COND	SCD_CND_FK
Foreign	PLT_CN	SUBP_COND to PLOT	SCD_PLT_FK
Foreign	PLT_CN, SUBP	SUBP_COND to SUBPLOT	SCD_SBP_FK

Note: The SUBP_COND record may not exist for some periodic inventory data.

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

2. PLT_CN — Plot sequence number. Foreign key linking the subplot condition record to the plot record.

3. INVYR Inventory year. See SURVEY.INVYR description for definition.

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

5. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

7. PLOT Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of variables, PLOT may be used to uniquely identify a plot.

8. SUBP Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit.

9. CONDID Condition class number. The unique identifying number assigned to a condition that exists on the subplot, and is defined in the COND table. See COND.CONDID for details on the attributes which delineate a condition.

10. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

11. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

12. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

13. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

14. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

15. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

16. MICRCOND_PROP

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

17. SUBPCOND_PROP

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

18. MACRCOND_PROP

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

19. NONFR_INCL_PCT_SUBP

    Nonforest inclusion percentage of subplot. Nonforest area estimate, expressed as a percentage, of the 24.0-foot, fixed-radius subplot present within a mapped, accessible forestland condition class in Oregon, Washington, and California. Only collected by certain FIA work units (SURVEY.RSCD = 26).

20. NONFR_INCL_PCT_MACRO

    Nonforest inclusion percentage of macroplot. Nonforest area estimate, expressed as a percentage, of the 58.9-foot, fixed-radius macroplot present within a mapped, accessible forestland condition class in Oregon, Washington, and California. Only collected by certain FIA work units (SURVEY.RSCD = 26).

21. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

22. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition

.

Boundary Table (Oracle table name is BOUNDARY)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	UNITCD	Survey unit code	NUMBER(2)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER(5)
8	SUBP	Subplot number	NUMBER(3)
9	SUBPTYP	Plot type code	NUMBER(1)
10	BNDCHG	Boundary change code	NUMBER(1)
11	CONTRAST	Contrasting condition	NUMBER(1)
12	AZMLEFT	Left azimuth	NUMBER(3)
13	AZMCORN	Corner azimuth	NUMBER(3)
14	DISTCORN	Corner distance	NUMBER(3)
15	AZMRIGHT	Right azimuth	NUMBER(3)
16	CYCLE	Inventory cycle number	NUMBER(2)
17	SUBCYCLE	Inventory subcycle number	NUMBER(2)
18	CREATED_BY	Created by	VARCHAR2(30)
19	CREATED_DATE	Created date	DATE
20	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
21	MODIFIED_BY	Modified by	VARCHAR2(30)
22	MODIFIED_DATE	Modified date	DATE
23	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	BND_PK
Unique	PLT_CN, SUBP, SUBPTYP, AZMLEFT, AZMRIGHT	N/A	BND_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, SUBP, SUBPTYP, AZMLEFT, AZMRIGHT	N/A	BND_NAT_I
Foreign	PLT_CN	BOUNDARY to PLOT	BND_PLT_FK

Note: The BOUNDARY record may not exist for some periodic inventory data.

1. CN Sequence number. A unique sequence number used to identify a boundary record.

2. PLT_CN Plot sequence number. Foreign key linking the boundary record to the plot record.

3. INVYR Inventory year. See SURVEY.INVYR description for definition.

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

5. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

7. PLOT Phase 2 plot number. An identifier for a plot. Along with STATECD, UNITCD, INVYR, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

8. SUBP Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit.

9. SUBPTYP Plot type code. Specifies whether the boundary data are for a subplot, microplot, or macroplot.

Code	Description
1	Subplot boundary
2	Microplot boundary
3	Macroplot boundary

10. BNDCHG Boundary change code. A code indicating the relationship between previously recorded and current boundary information. Set to blank (null) for new plots (PLOT.KINDCD = 1 or 3).

Code	Description
0	No change – boundary is the same as indicated on plot map by previous crew.
1	New boundary, or boundary data have 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 a previous crew.
3	Boundary has been changed to reflect a change in variable definition.

11. CONTRAST Contrasting condition. The condition class number of the condition class that contrasts with the condition class located at the subplot center (for boundaries on the subplot or macroplot) or at the microplot center (for boundaries on the microplot), e.g., the condition class present on the other side of the boundary.

12. AZMLEFT Left azimuth. The azimuth, to the nearest degree, from the subplot, microplot, or macroplot plot center to the farthest left point (facing the contrasting condition class) where the boundary intersects the subplot, microplot, or macroplot plot circumference.

13. AZMCORN Corner azimuth. The azimuth, to the nearest degree, from the subplot, microplot, or macroplot plot center to a corner or curve in a boundary. If a boundary is best described by a straight line between the two circumference points, then 000 is recorded for AZMCORN.

14. DISTCORN Corner distance. The horizontal distance, to the nearest 1 foot, from the subplot, microplot, or macroplot plot center to the boundary corner point. Blank (null) when AZMCORN = 000; populated when BOUNDARY.AZMCORN >000.

15. AZMRIGHT Right azimuth. The azimuth, to the nearest degree, from subplot, microplot, or macroplot plot center to the farthest right point (facing the contrasting condition) where the boundary intersects the subplot, microplot, or macroplot plot circumference.

16. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

17. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

18. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

19. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

20. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

21. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

22. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

23. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Subplot Condition Change Matrix (Oracle table name is SUBP_COND_CHNG_MTRX)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	STATECD	State code	NUMBER(4)
3	SUBP	Subplot number	NUMBER(1)
4	SUBPTYP	Subplot type	NUMBER(1)
5	PLT_CN	Plot sequence number	VARCHAR2(34)
6	CONDID	Condition class number	NUMBER(1)
7	PREV_PLT_CN	Previous plot sequence number	VARCHAR2(34)
8	PREVCOND	Previous condition class number	NUMBER(1)
9	SUBPTYP_PROP_CHNG	Percent change of subplot condition between previous to current inventory	NUMBER(5,4)
10	CREATED_BY	Created by	VARCHAR2(30)
11	CREATED_DATE	Created date	DATE
12	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
13	MODIFIED_BY	Modified by	VARCHAR2(30)
14	MODIFIED_DATE	Modified date	DATE
15	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	CMX_PK
Unique	PLT_CN, PREV_PLT_CN, SUBP, SUBPTYP, CONDID, PREVCOND	N/A	CMX_UK
Foreign	PREV_PLT_CN	SUBP_COND_CHNG_MTRX to PLOT	CMX_PLT_FK
Foreign	PLT_CN	SUBP_COND_CHNG_MTRX to PLOT	CMX_PLT_FK2

This table contains information about the mix of current and previous conditions that occupy the same area on the subplot. Figure 5 provides an illustration of how the information in this table is derived using data from two points in time that is stored in the BOUNDARY and COND tables.

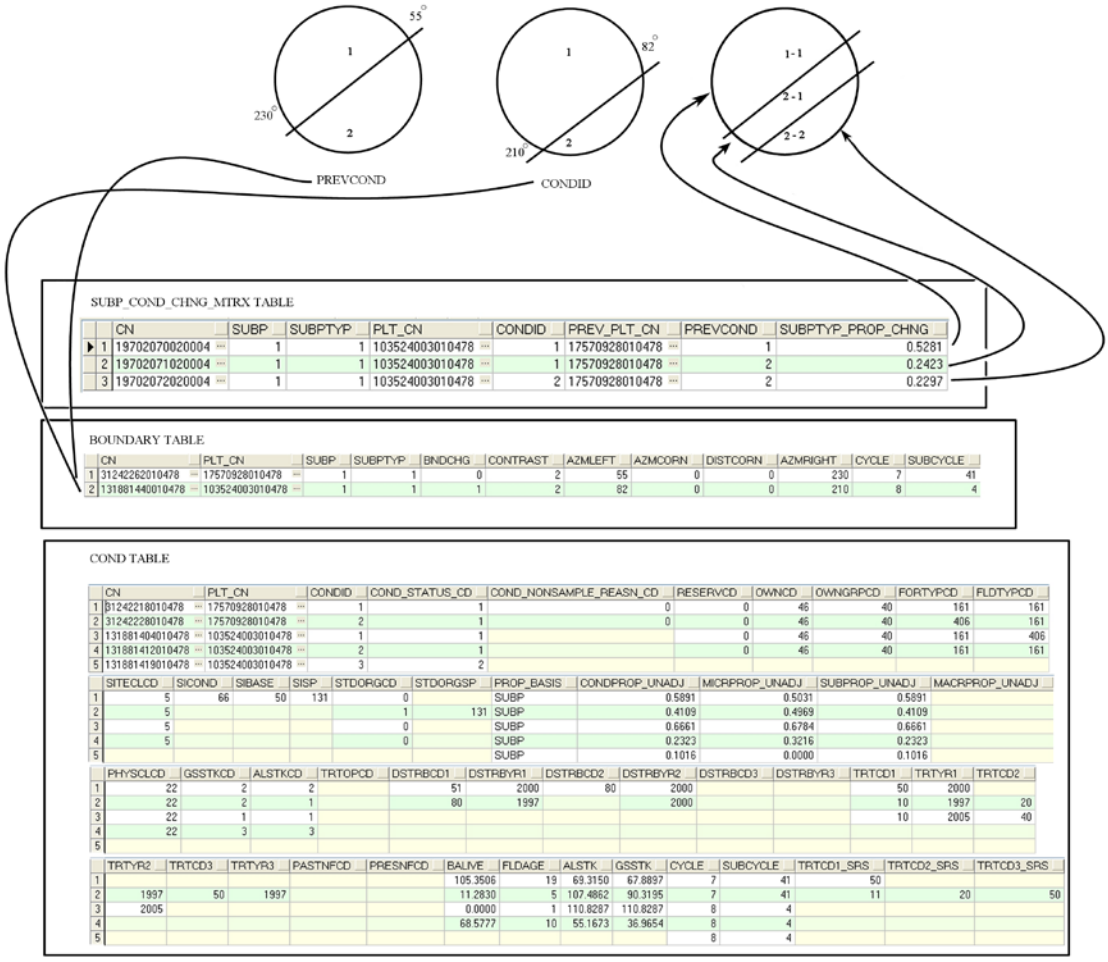


Figure 5. Illustration of the SUBP_COND_CHNG_MTRX table function

1. CN — Sequence number. A unique sequence number used to identify a change matrix table record.

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

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

4. SUBPTYP Plot type code. Specifies whether the record is for a subplot, microplot, or macroplot.

Code	Description
1	Subplot
2	Microplot
3	Macroplot

5. PLT_CN Plot sequence number. The foreign key linking the SUBP_COND_CHNG_MTRX record to the PLOT record for the current inventory.

6. CONDID Condition class number. The unique identifying number assigned to a condition that exists on the subplot, and is defined in the COND table. See COND.CONDID for details on the attributes which delineate a condition.

7. PREV_PLT_CN

   Previous plot sequence number. The foreign key linking the SUBP_COND_CHNG_MTRX record to the PLOT record from the previous inventory.

8. PREVCOND Previous condition class number. Identifies the condition class number from the previous inventory.

9. SUBPTYP_PROP_CHNG

   Subplot type proportion change. The unadjusted proportion of the subplot that is in the same geographic area condition for both the previous and current inventory. The sum of all subplot type change proportions for an individual plot equals 4 for each plot type (microplot, subplot, and/or macroplot). Divide the result by 4 to obtain change at the plot level.

10. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

11. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

12. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

13. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

14. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

15. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition

Tree Table (Oracle table name is TREE)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	PREV_TRE_CN	Previous tree sequence number	VARCHAR2(34)
4	INVYR	Inventory year	NUMBER(4)
5	STATECD	State code	NUMBER(4)
6	UNITCD	Survey unit code	NUMBER(2)
7	COUNTYCD	County code	NUMBER(3)
8	PLOT	Phase 2 plot number	NUMBER(5)
9	SUBP	Subplot number	NUMBER(3)
10	TREE	Tree record number	NUMBER(9)
11	CONDID	Condition class number	NUMBER(1)
12	AZIMUTH	Azimuth	NUMBER(3)
13	DIST	Horizontal distance	NUMBER(4,1)
14	PREVCOND	Previous condition number	NUMBER(1)
15	STATUSCD	Status code	NUMBER(1)
16	SPCD	Species code	NUMBER
17	SPGRPCD	Species group code	NUMBER(2)
18	DIA	Current diameter	NUMBER(5,2)
19	DIAHTCD	Diameter height code	NUMBER(1)
20	HT	Total height	NUMBER(3)
21	HTCD	Height method code	NUMBER(2)
22	ACTUALHT	Actual height	NUMBER(3)
23	TREECLCD	Tree class code	NUMBER(2)
24	CR	Compacted crown ratio	NUMBER(3)
25	CCLCD	Crown class code	NUMBER(2)
26	TREEGRCD	Tree grade code	NUMBER(2)
27	AGENTCD	Cause of death (agent) code	NUMBER(2)
28	CULL	Rotten and missing cull	NUMBER(3)
29	DAMLOC1	Damage location 1	NUMBER(2)
30	DAMTYP1	Damage type 1	NUMBER(2)
31	DAMSEV1	Damage severity 1	NUMBER(1)
32	DAMLOC2	Damage location 2	NUMBER(2)
33	DAMTYP2	Damage type 2	NUMBER(2)
34	DAMSEV2	Damage severity 2	NUMBER(1)
35	DECAYCD	Decay class code	NUMBER(2)
36	STOCKING	Tree stocking	NUMBER(7,4)
37	WDLDSTEM	Woodland tree species stem count	NUMBER(3)

	Column name	Descriptive name	Oracle data type
38	VOLCFNET	Net cubic-foot volume	NUMBER(11,6)
39	VOLCFGRS	Gross cubic-foot volume	NUMBER(11,6)
40	VOLCSNET	Net cubic-foot volume in the sawlog portion	NUMBER(11,6)
41	VOLCSGRS	Gross cubic-foot volume in the sawlog portion	NUMBER(11,6)
42	VOLBFNET	Net board-foot volume in the sawlog portion	NUMBER(11,6)
43	VOLBFGRS	Gross board-foot volume in the sawlog portion	NUMBER(11,6)
44	VOLCFSND	Sound cubic-foot volume	NUMBER(11,6)
45	GROWCFGS	Net annual merchantable cubic-foot growth of a growing-stock tree on timberland	NUMBER(11,6)
46	GROWBFSL	Net annual merchantable board-foot growth of a sawtimber-size tree on timberland	NUMBER(11,6)
47	GROWCFAL	Net annual sound cubic-foot growth of a live tree on timberland	NUMBER(11,6)
48	MORTCFGS	Cubic-foot volume of a growing-stock tree on timberland for mortality purposes	NUMBER(11,6)
49	MORTBFSL	Board-foot volume of a sawtimber-size tree on timberland for mortality purposes	NUMBER(11,6)
50	MORTCFAL	Sound cubic-foot volume of a tree on timberland for mortality purposes	NUMBER(11,6)
51	REMVCFGS	Cubic-foot volume of a growing-stock tree on timberland for removal purposes	NUMBER(11,6)
52	REMVBFSL	Board-foot volume of a sawtimber-size tree on timberland for removal purposes	NUMBER(11,6)
53	REMVCFAL	Sound cubic-foot volume of a tree on timberland for removal purposes	NUMBER(11,6)
54	DIACHECK	Diameter check code	NUMBER(2)
55	MORTYR	Mortality year	NUMBER(4)
56	SALVCD	Salvable dead code	NUMBER(2)
57	UNCRCD	Uncompacted live crown ratio	NUMBER(3)
58	CPOSCD	Crown position code	NUMBER(2)
59	CLIGHTCD	Crown light exposure code	NUMBER(2)
60	CVIGORCD	Crown vigor code (sapling)	NUMBER(2)
61	CDENCD	Crown density code	NUMBER(3)
62	CDIEBKCD	Crown dieback code	NUMBER(3)
63	TRANSCD	Foliage transparency code	NUMBER(3)
64	TREEHISTCD	Tree history code	NUMBER(3)
65	DIACALC	Current diameter calculated	NUMBER(5,2)
66	BHAGE	Breast height age	NUMBER(4)

	Column name	Descriptive name	Oracle data type
67	TOTAGE	Total age	NUMBER(4)
68	CULLDEAD	Dead cull	NUMBER(3)
69	CULLFORM	Form cull	NUMBER(3)
70	CULLMSTOP	Missing top cull	NUMBER(3)
71	CULLBF	Board-foot cull	NUMBER(3)
72	CULLCF	Cubic-foot cull	NUMBER(3)
73	BFSND	Board-foot cull soundness	NUMBER(3)
74	CFSND	Cubic-foot-cull soundness	NUMBER(3)
75	SAWHT	Sawlog height	NUMBER(2)
76	BOLEHT	Bole height	NUMBER(3)
77	FORMCL	Form class	NUMBER(1)
78	HTCALC	Current height calculated	NUMBER(3)
79	HRDWD_CLUMP_CD	Hardwood clump code	NUMBER(1)
80	SITREE	Calculated site index	NUMBER(3)
81	CREATED_BY	Created by	VARCHAR2(30)
82	CREATED_DATE	Created date	DATE
83	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
84	MODIFIED_BY	Modified by	VARCHAR2(30)
85	MODIFIED_DATE	Modified date	DATE
86	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
87	MORTCD	Mortality code	NUMBER(1)
88	HTDMP	Height to diameter measurement point	NUMBER(3,1)
89	ROUGHCULL	Rough cull	NUMBER(2)
90	MIST_CL_CD	Mistletoe class code	NUMBER(1)
91	CULL_FLD	Rotten/missing cull, field recorded	NUMBER(2)
92	RECONCILECD	Reconcile code	NUMBER(1)
93	PREVDIA	Previous diameter	NUMBER(5,2)
94	FGROWCFGS	Net annual merchantable cubic-foot growth of a growing-stock tree on forest land	NUMBER(11,6)
95	FGROWBFSL	Net annual merchantable board-foot growth of a sawtimber tree on forest land	NUMBER(11,6)
96	FGROWCFAL	Net annual sound cubic-foot growth of a live tree on forest land	NUMBER(11,6)
97	FMORTCFGS	Cubic-foot volume of a growing-stock tree for mortality purposes on forest land	NUMBER(11,6)
98	FMORTBFSL	Board-foot volume of a sawtimber tree for mortality purposes on forest land	NUMBER(11,6)
99	FMORTCFAL	Sound cubic-foot volume of a tree for mortality purposes on forest land	NUMBER(11,6)

	Column name	Descriptive name	Oracle data type
100	FREMVCFGS	Cubic-foot volume of a growing-stock tree for removal purposes on forest land	NUMBER(11,6)
101	FREMVBFSL	Board-foot volume of a sawtimber-size tree for removal purposes on forest land	NUMBER(11,6)
102	FREMVCFAL	Sound cubic-foot volume of the tree for removal purposes on forest land	NUMBER(11,6)
103	P2A_GRM_FLG	Periodic to annual growth, removal, and mortality flag	VARCHAR2(1)
104	TREECLCD_NERS	Tree class code, Northeastern Research Station	NUMBER(2)
105	TREECLCD_SRS	Tree class code, Southern Research Station	NUMBER(2)
106	TREECLCD_NCRS	Tree class code, North Central Research Station	NUMBER(2)
107	TREECLCD_RMRS	Tree class code, Rocky Mountain Research Station	NUMBER(2)
108	STANDING_DEAD_CD	Standing dead code	NUMBER(2)
109	PREV_STATUS_CD	Previous tree status code	NUMBER(1)
110	PREV_WDLDSTEM	Previous woodland stem count	NUMBER(3)
111	TPA_UNADJ	Trees per acre unadjusted	NUMBER(11,6)
112	TPAMORT_UNADJ	Mortality trees per acre per year unadjusted	NUMBER(11,6)
113	TPAREMV_UNADJ	Removal trees per acre per year unadjusted	NUMBER(11,6)
114	TPAGROW_UNADJ	Growth trees per acre unadjusted	NUMBER(11,6)
115	DRYBIO_BOLE	Dry biomass in the merchantable bole	NUMBER(13,6)
116	DRYBIO_TOP	Dry biomass in the top of the tree	NUMBER(13,6)
117	DRYBIO_STUMP	Dry biomass in the tree stump	NUMBER(13,6)
118	DRYBIO_SAPLING	Dry biomass of saplings	NUMBER(13,6)
119	DRYBIO_WDLD_SPP	Dry biomass of woodland tree species	NUMBER(13,6)
120	DRYBIO_BG	Dry biomass of the roots	NUMBER(13,6)
121	CARBON_AG	Carbon in the aboveground portion of the tree	NUMBER(13,6)
122	CARBON_BG	Carbon in the belowground portion of the tree	NUMBER(13,6)
123	CYCLE	Inventory cycle number	NUMBER(2)
124	SUBCYCLE	Inventory subcycle number	NUMBER(2)
125	BORED_CD_PNWRS	Tree bored code, Pacific Northwest Research Station	NUMBER(1)
126	DAMLOC1_PNWRS	Damage location 1, Pacific Northwest Research Station	NUMBER(2)
127	DAMLOC2_PNWRS	Damage location 2, Pacific Northwest Research Station	NUMBER(2)
128	DIACHECK_PNWRS	Diameter check, Pacific Northwest Research Station	NUMBER(1)
129	DMG_AGENT1_CD_PNWRS	Damage agent 1, Pacific Northwest Research Station	NUMBER(2)

	Column name	Descriptive name	Oracle data type
130	DMG_AGENT2_CD_PNWRS	Damage agent 2, Pacific Northwest Research Station	NUMBER(2)
131	DMG_AGENT3_CD_PNWRS	Damage agent 3, Pacific Northwest Research Station	NUMBER(2)
132	MIST_CL_CD_PNWRS	Leafy mistletoe class code, Pacific Northwest Research Station	NUMBER(1)
133	SEVERITY1_CD_PNWRS	Damage severity 1, Pacific Northwest Research Station for years 2001-2004	NUMBER(1)
134	SEVERITY1A_CD_PNWRS	Damage severity 1A, Pacific Northwest Research Station	NUMBER(2)
135	SEVERITY1B_CD_PNWRS	Damage severity 1B, Pacific Northwest Research Station	NUMBER(1)
136	SEVERITY2_CD_PNWRS	Damage severity 2, Pacific Northwest Research Station for years 2001-2004	NUMBER(1)
137	SEVERITY2A_CD_PNWRS	Damage severity 2A, Pacific Northwest Research Station starting in 2005	NUMBER(2)
138	SEVERITY2B_CD_PNWRS	Damage severity 2B, Pacific Northwest Research Station starting in 2005	NUMBER(1)
139	SEVERITY3_CD_PNWRS	Damage severity 3, Pacific Northwest Research Station for years 2001-2004	NUMBER(1)
140	UNKNOWN_DAMTYP1_PNWRS	Unknown damage type 1, Pacific Northwest Research Station	NUMBER(1)
141	UNKNOWN_DAMTYP2_PNWRS	Unknown damage type 2, Pacific Northwest Research Station	NUMBER(1)
142	PREV_PNTN_SRS	Previous periodic prism point, tree number, Southern Research Station	NUMBER(4)
143	DISEASE_SRS	Disease, Southern Research Station	NUMBER(1)
144	DIEBACK_SEVERITY_SRS	Dieback severity, Southern Research Station	NUMBER(2)
145	DAMAGE_AGENT_CD1	Damage agent code 1	NUMBER(5)
146	DAMAGE_AGENT_CD2	Damage agent code 2	NUMBER(5)
147	DAMAGE_AGENT_CD3	Damage agent code 3	NUMBER(5)
148	CENTROID_DIA	Centroid diameter	NUMBER(4,1)
149	CENTROID_DIA_HT	Calculated centroid diameter height	NUMBER(4,1)
150	CENTROID_DIA_HT_ ACTUAL	Actual stem centroid diameter height	NUMBER(4,1)
151	UPPER_DIA	Upper stem diameter	NUMBER(4,1)
152	UPPER_DIA_HT	Upper stem diameter height	NUMBER(4,1)

Type of key	Column(s)	Tables to link	Abbreviated notation
Primary	CN	N/A	TRE_PK
Unique	PLT_CN, SUBP, TREE	N/A	TRE_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, SUBP, TREE	N/A	TRE_NAT_I
Foreign	PLT_CN	TREE to PLOT	TRE_PLT_FK

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

2. PLT_CN — Plot sequence number. Foreign key linking the tree record to the plot record.

3. PREV_TRE_CN

   Previous tree sequence number. Foreign key linking the tree to the previous inventory's tree record for this tree. Only populated on trees remeasured from a previous annual inventory.

4. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

8. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

9. SUBP — Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit.

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

11. CONDID — Condition class number. The unique identifying number assigned to a condition on which the tree is located. See COND.CONDID for details on the attributes which delineate a condition.

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

13. DIST — Horizontal distance. The horizontal distance in feet from subplot center (microplot center for saplings) to the center of the base of the tree

(geographic center for multi-stemmed woodland species). This attribute is populated for live and standing dead trees in a forest condition that were measured on any of the four subplots of the national plot design. It may be populated for other tree records.

14. PREVCOND — Previous condition number. Identifies the condition within the plot on which the tree occurred at the previous inventory.

15. STATUSCD — Status code. A code indicating whether the sample tree is live, cut, or dead at the time of measurement. Includes dead and cut trees, which are required to estimate aboveground biomass and net annual volume for growth, mortality, and removals. This code is not used when querying data for change estimates. **Note**: New and replacement plots use only codes 1 and 2.

Code	Description
0	No status – Tree is not presently in the sample (remeasurement plots only). Tree was incorrectly tallied at the previous inventory, currently not tallied due to definition or procedural change, or is not tallied due to natural causes. RECONCILECD = 5-9 required for remeasured annual inventory data but not for periodic inventory data.
1	Live tree.
2	Dead tree.
3	Removed – Cut and removed by direct human activity related to harvesting, silviculture or land clearing. This tree is assumed to be utilized.

16. SPCD — Species code. An FIA tree species code. Refer to appendix F for codes.

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

18. DIA — Current diameter. The current diameter (in inches) of the sample tree at the point of diameter measurement. DIA is measured at either breast height (DBH) or at root collar (DRC). DBH is usually measured at 4.5 feet above the ground line on the uphill side of the tree. DRC is measured on woodland species (often multi-stemmed) at the ground line or at the stem root collar, whichever is higher. DRC is computed using the following formula:
DRC = SQRT [SUM (stem diameter^2)]

For additional information about where the tree diameter is measured, see DIAHTCD or HTDMP. DIA for live trees contains the measured value. DIA for cut and dead trees presents problems associated with uncertainty of when the tree was cut or died as well as structural deterioration of dead trees. Consult individual FIA work units for explanations of how DIA is collected for dead and cut trees.

19. DIAHTCD Diameter height code. A code indicating the location at which diameter was measured. For trees with code 1 (DBH), the actual measurement point may be found in HTDMP.

Code	Description
1	Breast height (DBH)
2	Root collar (DRC)

20. HT Total height. (*Core Phase 2: ≥5.0-inch DBH/DRC live trees; Core optional Phase 2: 1.0-4.9-inch DBH/DRC live trees and ≥5.0-inch DBH/DRC standing dead trees. Core Phase 3: ≥1.0-inch DBH/DRC live trees; Core optional Phase 3: ≥5.0 inch DBH/DRC standing dead trees*) The total length (height) of a sample tree (in feet) from the ground to the tip of the apical meristem beginning in PLOT.MANUAL = 1.1. The total length of a tree is not always its actual length. If the main stem is broken, the actual length is measured or estimated and the missing piece is added to the actual length to estimate total length. The amount added is determined by measuring the broken piece if it can be located on the ground; otherwise it is estimated. The minimum height for timber species is 5 feet and for woodland species is 1 foot.

21. HTCD Height method code. (*Core Phase 2: ≥5.0-inch DBH/DRC live trees; Core optional Phase 2: 1.0-4.9-inch DBH/DRC live trees and ≥5.0-inch DBH/DRC standing dead trees. Core Phase 3: ≥1.0-inch DBH/DRC live trees; Core optional Phase 3: ≥5.0-inch DBH/DRC standing dead trees*) A code indicating how length (height) was determined beginning in PLOT.MANUAL = 1.1.

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

22. ACTUALHT Actual height. *(Core Phase 2: live and standing dead trees with broken or missing tops, ≥5.0-inch DBH/DRC; Core optional Phase 2: live trees 1.0-4.9-inch DBH/DRC with broken or missing tops; Core Phase 3: live trees ≥1.0-inch DBH/DRC [with broken or missing tops] and standing dead trees ≥5.0-inch DBH/DRC [with broken or missing tops])* The length (height) of the tree to the nearest foot from ground level to the highest remaining portion of the tree still present and attached to the bole. If ACTUALHT = HT, then the tree does not have a broken top. If ACTUALHT <HT, then the tree does have a broken or missing top. The minimum height for timber species is 5 feet and for woodland species is 1 foot.

23. TREECLCD Tree class code. A code indicating the general quality of the tree. In annual inventory, this is the tree class for both live and dead trees at the time of current measurement. In periodic inventory, for cut and dead trees, this is the

tree class of the tree at the time it died or was cut. Therefore, cut and dead trees collected in periodic inventory can be coded as growing-stock trees.

Code	Description
2	Growing-stock – All live trees of commercial species that meet minimum merchantability standards. In general, these trees have at least one solid 8-foot section, are reasonably free of form defect on the merchantable bole, and at least 34 percent or more of the volume is merchantable. For the California, Oregon, and Washington inventories, a 26 percent or more merchantable volume standard is applied, rather than 34 percent or more. Excludes rough or rotten cull trees.
3	Rough cull – All live trees that do not now, or prospectively, have at least one solid 8-foot section, reasonably free of form defect on the merchantable bole, or have 67 percent or more of the merchantable volume cull; and more than half of this cull is due to sound dead wood cubic-foot loss or severe form defect volume loss. For the California, Oregon, and Washington inventories, 75 percent or more cull, rather than 67 percent or more cull, applies. This class also contains all trees of noncommercial species, or those species where SPGRPCD equals 23 (woodland softwoods), 43 (eastern noncommercial hardwoods), or 48 (woodland hardwoods). Refer to appendix F to find the species that have these SPGRPCD codes. For dead trees, this code indicates that the tree is salvable (sound).
4	Rotten cull – All live trees with 67 percent or more of the merchantable volume cull, and more than half of this cull is due to rotten or missing cubic-foot volume loss. California, Oregon, and Washington inventories use a 75 percent cutoff. For dead trees, this code indicates that the tree is nonsalvable (not sound).

24. CR — Compacted crown ratio. The percent of the tree bole supporting live, healthy foliage (the crown is ocularly compacted to fill in gaps) when compared to actual length (ACTUALHT). When PLOT.MANUAL <1.0 the variable may have been a code, which was converted to the midpoint of the ranges represented by the codes, and is stored as a percentage. May not be populated for periodic inventories.

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

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

26. TREEGRCD — Tree grade code. A code indicating the quality of sawtimber-sized trees. This attribute is populated for live, growing-stock, sawtimber-size trees on subplots 1-4 where PLOT.MANUAL ≥1.0 for plots that are in a forest condition class. This attribute may be populated for other tree records that do not meet the above criteria. For example, it may be populated with the previous tree grade on dead and cut trees. Standards for tree grading are

specific to species and differ slightly by research station. Only collected by certain FIA work units (SURVEY.RSCD = 23, 24, or 33). Tree grade codes range from 1 to 5.

27. AGENTCD — Cause of death (agent) code. (*Core: all remeasured plots when the tree was alive at the previous visit and at revisit is dead or removed OR the tree is standing dead in the current inventory and the tree is ingrowth, through growth, or a missed live tree; Core optional: all initial plot visits when tree qualifies as a mortality tree*) When PLOT.MANUAL ≥1.0, this variable was collected on only dead and cut trees. When PLOT.MANUAL <1.0, this variable was collected on all trees (live, dead, and cut). Cause of damage was recorded for live trees if the presence of damage or pathogen activity was serious enough to reduce the quality or vigor of the tree. When a tree was damaged by more than one agent, the most severe damage was coded. When no damage was observed on a live tree, 00 was recorded. Damage recorded for dead trees was the cause of death. Each FIA program records specific codes that may differ from one State to the next. These codes fall within the ranges listed below. For the specific codes used in a particular State, contact the FIA work unit responsible for that State (table 4).

Code	Description
00	No agent recorded (only allowed on live trees in data prior to 1999)
10	Insect
20	Disease
30	Fire
40	Animal
50	Weather
60	Vegetation (e.g., suppression, competition, vines/kudzu)
70	Unknown/not sure/other – includes death from human activity not related to silvicultural or 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).

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

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

Code	Description
0	No damage
1	Roots (exposed) and stump (up to 12 inches from ground level)
2	Roots, stump, and lower bole
3	Lower bole (lower half of bole between stump and base of live crown)
4	Lower and upper bole
5	Upper bole (upper half of bole between stump and base of live crown)

Code	Description
6	Crownstem (main stem within the live crown)
7	Branches (>1 inch diameter at junction with main stem and within the live crown)
8	Buds and shoots of current year
9	Foliage

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

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

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

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

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

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

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

35. DECAYCD Decay class code. A code indicating the stage of decay in a standing dead tree. Populated where PLOT.MANUAL ≥1.0.

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

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

37. WDLDSTEM Woodland tree species stem count. The number of live and dead stems used to calculate diameter on a woodland tree. Woodland species are identified in the REF_SPECIES table as REF_SPECIES.WOODLAND = X. These tree species have diameter measured at the root collar. For a stem to be counted, it must have a minimum stem size of 1 inch in diameter and 1 foot in length.

38. VOLCFNET Net cubic-foot volume. For timber species (trees where the diameter is measured at breast height [DBH]), this is the net volume of wood in the central stem of a sample tree ≥5.0 inches in diameter, from a 1-foot stump to a minimum 4-inch top diameter, or to where the central stem breaks into limbs all of which are <4.0 inches in diameter. For woodland species (woodland species can be identified by REF_SPECIES.WOODLAND = X), VOLCFNET is the net volume of wood and bark from the DRC measurement

point(s) to a 1 ½ -inch top diameter; includes branches that are at least 1½ inches in diameter along the length of the branch. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. This attribute is blank (null) for trees with DIA <5.0 inches. All trees measured after 1998 with DIA ≥5.0 inches (including standing dead trees) will have entries in this field. Does not include rotten, missing, and form cull (volume loss due to rotten, missing, and form cull defect has been deducted).

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

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

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

rough and rotten trees (TREECLCD = 3 or 4) and dead and cut trees (STATUSCD = 2 or 3) are blank (null) in this field.

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

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

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

45. GROWCFGS — Net annual merchantable cubic-foot growth of a growing-stock tree on timberland. This is the net change in cubic-foot volume per year of this tree (for remeasured plots, $(V_2 - V_1)/(t_2 - t_1)$; where 1 and 2 denote the past and

current measurement, respectively, V is volume, and t indicates year of measurement). Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality ($V_2 = 0$) but can also occur on live trees that have a net loss in volume because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ.

46. GROWBFSL — Net annual merchantable board-foot growth of a sawtimber-size tree on timberland. This is the net change in board-foot (International ¼-inch rule) volume per year of this tree (for remeasured plots $(V_2 - V_1)/(t_2 - t_1)$). Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality ($V_2 = 0$) but can also occur on live trees that have a net loss in volume because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ.

47. GROWCFAL — Net annual sound cubic-foot growth of a live tree on timberland. The net change in cubic-foot volume per year of this tree (for remeasured plots $(V_2 - V_1)/(t_2 - t_1)$). Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality ($V_2 = 0$) but can also occur on live trees that have a net loss in volume because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ. GROWCFAL differs from GROWCFGS by including all trees, regardless of tree class.

48. MORTCFGS — Cubic-foot volume of a growing-stock tree on timberland for mortality purposes. Represents the cubic-foot volume of a growing-stock tree at time of death. To obtain estimates of annual per acre mortality, multiply by TPAMORT_UNADJ.

49. MORTBFSL — Board-foot volume of a sawtimber-size tree on timberland for mortality purposes. Represents the board-foot (International ¼-inch rule) volume of a sawtimber tree at time of mortality. To obtain estimates of annual per acre mortality, multiply by TPAMORT_UNADJ.

50. MORTCFAL — Sound cubic-foot volume of a tree on timberland for mortality purposes. Represents the cubic-foot volume of the tree at time of mortality. To obtain estimates of annual per acre mortality, multiply by TPAMORT_UNADJ. MORTCFAL differs from MORTCFGS by including all trees, regardless of tree class.

51. REMVCFGS — Cubic-foot volume of a growing-stock tree on timberland for removal purposes. Represents the cubic-foot volume of the tree at time of removal. To obtain estimates of annual per acre removals, multiply by TPAREMV_UNADJ.

52. REMVBFSL — Board-foot volume of a sawtimber-size tree on timberland for removal purposes. Represents the board-foot (International ¼-inch rule) volume of the

tree at time of removal. To obtain estimates of annual per acre removals, multiply by TPAREMV_UNADJ.

53. REMVCFAL Sound cubic-foot volume of a tree on timberland for removal purposes. Represents the cubic-foot volume of the tree at time of removal. To obtain estimates of annual per acre removals, multiply by TPAREMV_UNADJ. REMVCFAL differs from REMVCFGS by including all trees, regardless of tree class.

54. DIACHECK Diameter check code. A code indicating the reliability of the diameter measurement.

Code	Description
0	Diameter accurately measured
1	Diameter estimated
2	Diameter measured at different location than previous measurement (remeasurement trees only)
5	Diameter modeled in the office (used with periodic inventories)
Note: If both codes 1 and 2 apply, code 2 is used.	

55. MORTYR Mortality year. (*Core optional*) The estimated year in which a remeasured tree died or was cut. Populated where PLOT.MANUAL ≥1.0 and populated by some FIA work units where PLOT.MANUAL <1.0.

56. SALVCD Salvable dead code. A standing or down dead tree considered merchantable by regional standards. Contact the appropriate FIA work unit for information on how this code is assigned for a particular State (table 4).

Code	Description
0	Dead not salvable
1	Dead salvable

57. UNCRCD Uncompacted live crown ratio. (*Core optional Phase 2: ≥5.0-inch live trees; Core Phase 3: ≥1.0-inch live trees*) Percentage determined by dividing the live crown length by the actual tree length. When PLOT.MANUAL <3.0 the variable was a code, which was converted to the midpoint of the ranges represented by the codes, and is stored as a percentage.

58. CPOSCD Crown position code. (*Core on Phase 3 plots only.*) The relative position of each tree in relation to the overstory canopy.

Code	Description
1	Superstory
2	Overstory
3	Understory
4	Open canopy

59. CLIGHTCD Crown light exposure code. (*Core optional on Phase 2 plots; Core on Phase 3 plots only*) A code indicating the amount of light being received by the tree

crown. Collected for all live trees at least 5 inches DBH/DRC. Trees with UNCRCD <35 have a maximum CLIGHTCD of 1.

Code	Description
0	The tree receives no direct sunlight because it is shaded by adjacent trees or other vegetation
1	Receives full light from the top or 1 side
2	Receives full light from the top and 1 side (or 2 sides without the top)
3	Receives full light from the top and 2 sides (or 3 sides without the top)
4	Receives full light from the top and 3 sides
5	Receives full light from the top and 4 sides

60. CVIGORCD Crown vigor code. (*Core optional on Phase 2 plots; Core on Phase 3 plots only*) A code indicating the vigor of sapling crowns. Collected for live trees between 1 and 4.9 inches DBH/DRC.

Code	Description
1	Saplings must have an uncompacted live crown ratio of 35 or higher, have <5 percent dieback (deer/rabbit browse is not considered as dieback but is considered missing foliage) and 80 percent or more of the foliage present is normal or at least 50 percent of each leaf is not damaged or missing. Twigs and branches that are dead because of normal shading are not included.
2	Saplings do not meet class 1 or 3 criteria. They may have any uncompacted live crown ratio, may or may not have dieback and may have between 21 and 100 percent of the foliage classified as normal.
3	Saplings may have any uncompacted live crown ratio and have 1 to 20 percent normal foliage or the percent of foliage missing combined with the percent of leaves that are over 50 percent damaged or missing should equal 80 percent or more of the live crown. Twigs and branches that are dead because of normal shading are not included. Code is also used for saplings that have no crown by definition.

61. CDENCD Crown density code. (*Core optional on Phase 2 plots; Core on Phase 3 plots only*) A code indicating how dense the tree crown is, estimated in percent classes. Collected for all live trees at least 5 inches DBH/DRC. Crown density is the amount of crown branches, foliage and reproductive structures that blocks light visibility through the crown.

Code	Description
00	0%
05	1-5%
10	6-10%
15	11-15%
20	16-20%
25	21-25%
30	26-30%
35	31-35%
40	36-40%
45	41-45%
50	46-50%
55	51-55%
60	56-60%
65	61-65%
70	66-70%
75	71-75%
80	76-80%

Code	Description
85	81-85%
90	86-90%
95	91-95%
99	96-100%

62. CDIEBKCD Crown dieback code. (*Core optional on Phase 2 plots; Core on Phase 3 plots only*) A code indicating the amount of recent dead material in the upper and outer portion of the crown, estimated in percent classes. Collected for all live trees at least 5 inches DBH/DRC.

Code	Description
00	0%
05	1-5%
10	6-10%
15	11-15%
20	16-20%
25	21-25%
30	26-30%
35	31-35%
40	36-40%
45	41-45%
50	46-50%
55	51-55%
60	56-60%
65	61-65%
70	66-70%
75	71-75%
80	76-80%
85	81-85%
90	86-90%
95	91-95%
99	96-100%

63. TRANSCD Foliage transparency code. (*Core optional on Phase 2 plots; Core on Phase 3 plots only*) A code indicating the amount of light penetrating the foliated portion of the crown, estimated in percent classes. Collected for all live trees at least 5 inches DBH/DRC.

Code	Description
00	0%
05	1-5%
10	6-10%
15	11-15%
20	16-20%
25	21-25%
30	26-30%
35	31-35%
40	36-40%
45	41-45%

Code	Description
50	46-50%
55	51-55%
60	56-60%
65	61-65%
70	66-70%
75	71-75%
80	76-80%
85	81-85%
90	86-90%
95	91-95%
99	96-100%

64. TREEHISTCD Tree history code. Identifies the tree with detailed information as to whether the tree is live, dead, cut, removed due to land use change, etc. Contact the appropriate FIA work unit for the definitions (table 4). Only collected by certain FIA work units (SURVEY.RSCD = 23, 24, or 33).

65. DIACALC Current diameter calculated. If the diameter is unmeasurable (e.g., the tree is cut or dead), the diameter is calculated (in inches) and stored in this variable. Only collected by certain FIA work units (SURVEY.RSCD = 23 or 33).

66. BHAGE Breast height age. The age of a live tree derived from counting tree rings from an increment core sample extracted at a height of 4.5 feet above ground. Breast height age is collected for a subset of trees and only for trees that the diameter is measured at breast height (DBH). This data item is used to calculate classification variables such as stand age. For PNWRS, one tree is sampled for BHAGE for each species, within each crown class, and for each condition class present on a plot. Age of saplings (<5.0 inches DBH) may be aged by counting branch whorls above 4.5 feet. No timber hardwood species other than red alder are bored for age. For RMRS, one tree is sampled for each species and broad diameter class present on a plot. Only collected by certain FIA work units (SURVEY.RSCD = 22 or 26) and is left blank (null) when it is not collected.

67. TOTAGE Total age. The age of a live tree derived either from counting tree rings from an increment core sample extracted at the base of a tree where diameter is measured at root collar (DRC), or for small saplings (1.0 to 2.9 inches DBH) by counting all branch whorls, or by adding a species-dependent number of years to breast height age. Total age is collected for a subset of trees and is used to calculate classification variables such as stand age. Only collected by certain FIA work units (SURVEY.RSCD = 22 or 26) and is left blank (null) when it is not collected.

68. CULLDEAD Dead cull. The percent of the gross cubic-foot volume that is cull due to sound dead material. Recorded for all trees that are at least 5.0 inches in diameter. Only collected by certain FIA work units (SURVEY.RSCD = 22).

This attribute is blank (null) for trees smaller than 5 inches and is always null for the other FIA work units.

69. CULLFORM — Form cull. The percent of the gross cubic-foot volume that is cull due to form defect. Recorded for live trees that are at least 5.0 inches DBH. Only collected by certain FIA work units (SURVEY.RSCD = 22). This attribute is blank (null) for dead trees, trees smaller than 5 inches DBH, for all trees where the diameter is measured at root collar (DRC), and is always null for the other FIA work units.

70. CULLMSTOP — Missing top cull. The percent of the gross cubic-foot volume that is cull due to a missing (broken) merchantable top. Recorded for trees that are at least 5.0 inches in diameter. The volume estimate does not include any portion of the missing top that is <4.0 inches DOB (diameter outside bark). Many broken top trees may have 0 percent missing top cull because no merchantable volume was lost. Only collected by certain FIA work units (SURVEY.RSCD = 22). This attribute is blank (null) for trees smaller than 5 inches diameter and is always null for the other FIA work units.

71. CULLBF — Board-foot cull. The percent of the gross board-foot volume that is cull due to rot or form. Only collected by certain FIA work units (SURVEY.RSCD = 24).

72. CULLCF — Cubic-foot cull. The percent of the gross cubic-foot volume that is cull due to rot or form. Only collected by certain FIA work units (SURVEY.RSCD = 24).

73. BFSND — Board-foot-cull soundness. The percent of the board-foot cull that is sound (due to form). Only collected by certain FIA work units (SURVEY.RSCD = 24).

74. CFSND — Cubic-foot-cull soundness. The percent of the cubic-foot cull that is sound (due to form). Only collected by certain FIA work units (SURVEY.RSCD = 24).

75. SAWHT — Sawlog height. The length (height) of a tree, recorded to a 7-inch top (9-inch for hardwoods), where at least one 8-foot log, merchantable or not, is present. On broken topped trees, sawlog length is recorded to the point of the break. Only collected by certain FIA work units (SURVEY.RSCD = 24).

76. BOLEHT — Bole height. The length (height) of a tree, recorded to a 4-inch top, where at least one 4-foot section is present. Only collected by certain FIA work units (SURVEY.RSCD = 24).

77. FORMCL — Form class. A code used in calculating merchantable bole net volume. Recorded for all live hardwood trees tallied that are ≥5.0 inch DBH/DRC. Also recorded for conifers ≥5.0 inch DBH in Region 5 National Forests. Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

78. HTCALC Current height calculated. If the height is unmeasurable (e.g., the tree is cut or dead), the height is calculated (in feet) and stored in this variable. Only collected by certain FIA work units (SURVEY.RSCD = 33).

79. HRDWD_CLUMP_CD

    Hardwood clump code. A code sequentially assigned to each hardwood clump within each species as they are found on a subplot. Up to 9 hardwood clumps can be identified and coded within each species on each subplot. A clump is defined as having 3 or more live stems originating from a common point on the root system. Woodland hardwood species are not evaluated for clump code. Clump code data are used to adjust stocking estimates since trees growing in clumps contribute less to stocking than do individual trees. Only collected by certain FIA work units (SURVEY.RSCD = 26).

80. SITREE Calculated site index. Computed for every tree. The site index represents the average total length (in feet) that dominant and co-dominant trees in fully-stocked, even-aged stands (of the same species as this tree) will obtain at key ages (usually 25 or 50 years). Only computed by certain FIA work units (SURVEY.RSCD = 23).

81. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

82. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

83. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

84. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

85. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

86. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

87. MORTCD Mortality code. (*Core optional*) Used for a tree that was alive within past 5 years, but has died.

Code	Description
0	Tree does not qualify as mortality.
1	Tree does qualify as mortality.

88. HTDMP Height to diameter measurement point. (*Core optional*) For trees measured directly at 4.5 feet above ground, this item is blank (null). If the diameter is not measured at 4.5 feet, 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.

89. ROUGHCULL Rough cull. (*Core optional*) Percentage of sound dead cull, as a percent of the merchantable bole/portion of the tree.

90. MIST_CL_CD Mistletoe class code. (*Core optional*) A rating of dwarf mistletoe infection. Recorded on all live conifer species except juniper. Using the Hawksworth (1979) six-class rating system, the live crown is divided into thirds, and each third is rated using the following scale: 0 is for no visible infection, 1 for <50 percent of branches infected, 2 for >50 percent of branches infected. The ratings for each third are summed together to yield the Hawksworth rating.

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

91. CULL_FLD Rotten/missing cull, field -recorded. (*Core: ≥5.0-inch live trees; Core optional: ≥5.0-inch standing dead trees*) The percentage rotten or missing cubic-foot cull volume, estimated to the nearest 1 percent. This estimate does not include any cull estimate above actual length; therefore volume lost from a broken top is not included (see CULL for percent cull including cull from broken top). When field crews estimate volume loss (tree cull), they only consider the cull on the merchantable bole/portion of the tree, from a 1-foot stump to a 4-inch top diameter outside bark (DOB). For woodland species, the merchantable portion is between the point of DRC measurement to a 1.5-inch top DOB.

92. RECONCILECD

Reconcile code. Recorded for remeasurement locations only. A code indicating the reason a tree either enters or is no longer a part of the inventory.

Code	Description
1	Ingrowth – either a new tally tree not qualifying as through growth or a new tree on land that was formerly nonforest and now qualifies as forest land (includes reversion or encroachments).
2	Through growth – new tally tree 5 inches DBH/DRC and larger, within the microplot, which was not missed at the previous inventory.
3	Missed live – a live tree missed at previous inventory and that is live, dead, or removed now.
4	Missed dead – a dead tree missed at previous inventory and that is dead or removed now.
5	Shrank – live tree that shrunk below threshold diameter on microplot/subplot/macroplot plot.
6	Missing (moved) – tree was correctly tallied in previous inventory, but has now moved beyond the radius of the plot due to natural causes (e.g., small earth movement, hurricane). 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 STATUSCD = 2 (not 0).
7	Cruiser error – erroneously tallied at previous inventory
8	Procedural change – tree was tallied at the previous inventory, but is no longer tallied due to a definition or procedural change.
9	Tree was sampled before, but now the area where the tree was located is nonsampled. All trees on the nonsampled area have RECONCILECD = 9.

93. PREVDIA Previous diameter. The previous diameter (in inches) of the sample tree at the point of diameter measurement. Populated for remeasured trees.

94. FGROWCFGS Net annual merchantable cubic-foot growth of a growing-stock tree on forest land. This is the net change in cubic-foot volume per year of this tree (for remeasured plots, $(V_2 - V_1)/(t_2 - t_1)$; where 1 and 2 denote the past and current measurement, respectively, V is volume, t indicates date of measurement, and $t_2 – t_1$ = PLOT.REMPER). Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality ($V_2 = 0$) but can also occur on live trees that have a net loss in volume because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ.

95. FGROWBFSL Net annual merchantable board-foot growth of a sawtimber tree on forest land. This is the net change in board-foot (International ¼ -inch rule) volume per year of this tree (for remeasured plots $(V_2 - V_1)/(t_2-t_1)$). Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality ($V_2 = 0$) but can also occur on live trees that have a net loss in volume because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ.

96. FGROWCFAL Net annual sound cubic-foot growth of a live tree on forest land. The net change in cubic-foot volume per year of this tree (for remeasured plots $(V_2 - V_1)/(t_2 - t_1)$). Because this value is net growth, it may be a negative number. Negative growth values are usually due to mortality ($V_2 = 0$) but can also occur on live trees that have a net loss in volume because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ. FGROWCFAL differs from FGROWCFGS by including all trees, regardless of tree class.

97. FMORTCFGS Cubic-foot volume of a growing-stock tree for mortality purposes on forest land. Represents the cubic-foot volume of a growing-stock tree at time of mortality. To obtain estimates of annual per acre mortality, multiply by TPAMORT_UNADJ.

98. FMORTBFSL Board-foot volume of a sawtimber tree for mortality purposes on forest land. Represents the board-foot (International ¼-rule) volume of a sawtimber tree at time of mortality. To obtain estimates of annual per acre mortality, multiply by TPAMORT_UNADJ.

99. FMORTCFAL Sound cubic-foot volume of a tree for mortality purposes on forest land. Represents the cubic-foot volume of the tree at time of mortality. To obtain estimates of annual per acre mortality, multiply by TPAMORT_UNADJ. FMORTCFAL differs from FMORTCFGS by including all trees, regardless of tree class.

100. FREMVCFGS Cubic-foot volume of a growing-stock tree for removal purposes on forest land. Represents the cubic-foot volume of the tree at time of removal. To obtain estimates of annual per acre removals, multiply by TPAREMV_UNADJ.

101. FREMVBFSL Board-foot volume of a sawtimber-size tree for removal purposes on forest land. Represents the board-foot (International ¼-rule) volume of the tree at time of removal. To obtain estimates of annual per acre removals, multiply by TPAREMV_UNADJ.

102. FREMVCFAL Sound cubic-foot volume of the tree for removal purposes on forest land. Represents the cubic-foot volume of the tree at time of removal. To obtain estimates of annual per acre removals, multiply by TPAREMV_UNADJ. FREMVCFAL differs from FREMVCFGS by including all trees, regardless of tree class.

103. P2A_GRM_FLG

Periodic to annual growth, removal, and mortality flag. A code indicating if this tree is part of a periodic inventory (usually from a variable-radius plot design) that is only included for the purposes of computing growth, removals and/or mortality estimates. This tree does not contribute to current estimates of such attributes as volume, biomass or number of trees. The flag is set to Y for those trees that are needed for estimation and otherwise is left blank (null).

104. TREECLCD_NERS

Tree class code, Northeastern Research Station. In annual inventory, this code represents a classification of the overall quality of a tree that is 5.0 inches DBH and larger. It classifies the quality of a sawtimber tree based on the present condition, or it classifies the quality of a poletimber tree as a

prospective determination (i.e., a forecast of potential quality when and if the tree becomes sawtimber size). For more detailed description, see the regional field guide. Only collected by certain FIA work units (SURVEY.RSCD = 24).

Code	Description
1	Preferred – Live tree that would be favored in cultural operations. Mature tree, that is older than the rest of the stand; has less than 20 percent total board foot cull; is expected to live for 5 more years: and is a low risk tree. In general, the tree has the following qualifications: • must be free from "general" damage (i.e., damages that would now or prospectively cause a reduction of tree class, significantly deter growth, or prevent it from producing marketable products in the next 5 years). • should have no more than 10 percent board-foot cull due to form defect. • should have good vigor, usually indicated by a crown ratio of 30 percent or more and dominant or co-dominant. • usually has a grade 1 butt log.
2	Acceptable – This class includes: • live sawtimber tree that does not qualify as a preferred tree but is not a cull tree (see Rough and Rotten Cull). • live poletimber tree that prospectively will not qualify as a preferred tree, but is not now or prospectively a cull tree (see Rough and Rotten Cull).
3	Rough Cull – This class includes: • live sawtimber tree that currently has 67 percent or more predominantly sound board-foot cull; or does not contain one merchantable 12-foot sawlog or two non-contiguous merchantable 8-foot sawlogs. • live poletimber tree that currently has 67 percent or more predominantly sound cubic-foot cull; or prospectively will have 67 percent or more predominantly sound board-foot cull; or will not contain one merchantable 12-foot sawlog or two noncontiguous merchantable 8-foot sawlogs.
4	Rotten Cull – This class includes: • live sawtimber tree that currently has 67 percent or more predominantly unsound board-foot cull. • live poletimber tree that currently has 67 percent or more predominantly unsound cubic-foot cull; or prospectively will have 67 percent or more predominantly unsound board-foot cull.
5	Dead – Tree that has recently died (within the last several years); but still retains many branches (including some small branches and possibly some fine twigs); and has bark that is generally tight and hard to remove from the tree.
6	Snag – Dead tree, or what remains of a dead tree, that is at least 4.5 feet tall and is missing most of its bark. This category includes a tree covered with bark that is very loose. This bark can usually be removed, often times in big strips, with very little effort. A snag is not a recently dead tree. Most often, it has been dead for several years – sometimes, for more than a decade.

105. TREECLCD_SRS

Tree class code, Southern Research Station. A code indicating the general quality of the tree. Prior to the merger of the Southern and Southeastern Research Stations (INVYR ≤1997), a growing-stock classification (code 2) was only assigned to species that were considered to have commercial value. Since the merger (INVYR >1997), code 2 has been applied to all tree species meeting the growing-stock form, grade, size and soundness requirements, regardless of commercial value. Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
2	Growing-stock – All trees that have at least one 12-foot log or two 8-foot logs that meet grade and size requirements and at least ⅓ of the total board foot volume is merchantable. Poletimber-sized trees are evaluated based on their potential.
3	Rough cull – Trees that do not contain at least one 12-foot log or two 8-foot logs, or more than ⅓ of the total board foot volume is not merchantable, primarily due to roughness or poor form.
4	Rotten cull: Trees that do not contain at least one 12-foot log or two 8-foot logs, or more than ⅓ of the total board foot volume is not merchantable, primarily due to rotten, unsound wood.

106. TREECLCD_NCRS

Tree class code, North Central Research Station. In annual inventory, a code indicating tree suitability for timber products, or the extent of decay in the butt section of down-dead trees. It is recorded on live standing, standing-dead, and down dead trees that are 1.0 inches DBH and larger. Tree class is basically a check for the straightness and soundness of the sawlog portion on a sawtimber tree or the potential sawlog portion on a poletimber tree or sapling. "Sawlog portion" is defined as the length between the 1-foot stump and the 9.0-inch top diameter of outside bark, DOB, for hardwoods, or the 7.0-inch top DOB for softwoods. For more detailed description, see the regional field guide http://www.nrs.fs.fed.us/fia/data-collection/. Only collected by certain FIA work units (SURVEY.RSCD = 23).

Code	Description
20	Growing-stock – Any live tree of commercial species that is saw-timber size and has at least one merchantable 12-foot sawlog or two merchantable 8-foot sawlogs meeting minimum log-grade requirements. At least one-third of the gross board-foot volume of the sawlog portion must be merchantable material. A merchantable sawlog must be at least 50 percent sound at any point. Any pole timber size tree that has the potential to meet the above specifications.
30	Rough Cull, Salvable, and Salvable-down – Includes any tree of noncommercial species, or any tree that is saw-timber size and has no merchantable sawlog. Over one-half of the volume in the sawlog portion does not meet minimum log-grade specifications due to roughness, excessive sweep or crook, splits, cracks, limbs, or forks. Rough cull pole-size trees do not have the potential to meet the specifications for growing-stock because of forks, limb stoppers, or excessive sweep or crook. A down-dead tree ≥5.0-inch DBH that meets these standards is given a tree/decay code of 30.
31	Short-log Cull – Any live saw-timber-size tree of commercial species that has at least one 8-foot sawlog, but less than a 12-foot sawlog, meeting minimum log-grade specifications. Any live saw-timber-size tree of commercial species that has less than one-third of the volume of the sawlog portion in merchantable logs, but has at least one 8-foot or longer sawlog meeting minimum log-grade specifications. A short sawlog must be 50 percent sound at any point. Pole-size trees never receive a tree class code 31.
40	Rotten Cull – Any live tree of commercial species that is saw-timber size and has no merchantable sawlog. Over one-half of the volume in the sawlog portion does not meet minimum log-grade specifications primarily because of rot, missing sections, or deadwood. Classify any pole-size tree that does not have the potential to meet the specifications for growing-stock because of rot as rotten cull. Assume that all live trees will eventually attain sawlog size at DBH. Predicted death, tree vigor, and plot site index are not considered in determining tree class. A standing-dead tree without an 8-foot or longer section that is at least 50 percent sound has a tree class of 40. On remeasurement of a sapling, if it has died and is still standing it is given a tree class of 40.

107. TREECLCD_RMRS

Tree class code, Rocky Mountain Research Station. A code indicating the general quality of the tree. Only collected by certain FIA work units (SURVEY.RSCD = 22).

Code	Description
1	Sound-live timber species – All live timber trees (species with diameter measured at breast height) that meet minimum merchantability standards. In general, these trees have at least one solid 8-foot section, are reasonably free of form defect on the merchantable bole, and at least 34 percent or more of the volume is merchantable. Excludes rough or rotten cull timber trees.
2	All live woodland species – All live woodland trees (woodland species can be identified by REF_SPECIES.WOODLAND = X). All trees assigned to species groups 23 and 48 belong in this category (see appendix E).
3	Rough-live timber species – All live trees that do not now, or prospectively, have at least one solid 8-foot section, reasonably free of form defect on the merchantable bole, or have 67 percent or more of the merchantable volume cull; and more than half of this cull is due to sound dead wood cubic-foot loss or severe form defect volume loss.
4	Rotten-live timber species – All live trees with 67 percent or more of the merchantable volume cull, and more than half of this cull is due to rotten or missing cubic-foot volume loss.
5	Hard (salvable) dead – dead trees that have less than 67 percent of the volume cull due to rotten or missing cubic-foot volume loss.
6	Soft (nonsalvable) dead – dead trees that have 67 percent or more of the volume cull due to rotten or missing cubic-foot volume loss.

108. STANDING_DEAD_CD

Standing dead code. A code indicating if a tree qualifies as standing dead. To qualify as a standing dead tally tree, the dead tree must be at least 5.0 inches in diameter, have a bole that has an unbroken actual length of at least 4.5 feet, and lean less than 45 degrees from vertical as measured from the base of the tree to 4.5 feet. Populated where PLOT.MANUAL ≥2.0; may be populated using information collected on dead trees in earlier inventories for dead trees.

For woodland species with multiple stems, a tree is considered down if more than ⅔ of the volume is no longer attached or upright; cut and removed volume is not considered. For woodland species with single stems to qualify as a standing dead tally tree, dead trees must be at least 5.0 inches in diameter, be at least 1.0 foot in unbroken ACTUAL LENGTH, and lean less than 45 degrees from vertical.

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

109. PREV_STATUS_CD

Previous tree status code. Tree status that was recorded at the previous inventory on all tally trees ≥1.0 inch in diameter.

Code	Description
1	Live tree – live tree at the previous inventory
2	Dead tree – standing dead at the previous inventory

110. PREV_WDLDSTEM

Previous woodland stem count. Woodland tree species stem count that was recorded at the previous inventory.

111. TPA_UNADJ Trees per acre unadjusted. The number of trees per acre that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD = 1), TPA_UNADJ is set to a constant derived from the plot size and equals 6.018046 for trees sampled on subplots, 74.965282 for trees sampled on microplots, and 0.999188 for trees sampled on macroplots. Variable-radius plots were often used in earlier inventories, so the value in TPA_UNADJ decreases as the tree diameter increases. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

112. TPAMORT_UNADJ

Mortality trees per acre per year unadjusted. The number of mortality trees per acre per year that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD =1), TPAMORT_UNADJ is set to a constant derived from the plot size divided by PLOT.REMPER. Variable-radius plots were often used in earlier inventories, so the value in TPAMORT_UNADJ decreases as the tree diameter increases. This attribute will be blank (null) if the tree does not contribute to mortality estimates. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

113. TPAREMV_UNADJ

Removal trees per acre per year unadjusted. The number of removal trees per acre per year that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD =1), TPAREMV_UNADJ is set to a constant derived from the plot size divided by PLOT.REMPER. Variable-radius plots were often used in earlier inventories, so the value in TPAREMV_UNADJ decreases as the tree diameter increases. This attribute will be blank (null) if the tree does not contribute to removals estimates. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

114. TPAGROW_UNADJ

Growth trees per acre unadjusted. The number of growth trees per acre that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD = 1), TPAGROW_UNADJ is set to a constant derived from the plot size. Variable-radius plots were often used in earlier inventories, so the value in TPAGROW_UNADJ decreases as the tree diameter increases. This attribute will be blank (null) if the tree does not contribute to growth estimates. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

115. DRYBIO_BOLE

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

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

Appendix M contains equations used to estimate biomass components in the FIADB.

117. DRYBIO_STUMP

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

118. DRYBIO_SAPLING

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

119. DRYBIO_WDLD_SPP

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

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

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

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

122. CARBON_BG Carbon in the belowground portion of the tree. The carbon (pounds) of coarse roots >0.1 inch in root diameter. Calculated for live trees with a diameter ≥1 inch, and dead trees with a diameter ≥5 inches, for both timber and woodland species. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Carbon is assumed to be one-half the value of belowground biomass as follows:

CARBON_BG = 0.5 * DRYBIO_BG

123. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

124. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

125. BORED_CD_PNWRS

Tree bored code, Pacific Northwest Research Station. Used in conjunction with tree age (BHAGE and TOTAGE). Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

126. DAMLOC1_PNWRS

Damage location 1, Pacific Northwest Research Station. The location on the tree where Damage Agent 1 is found. Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

127. DAMLOC2_PNWRS

Damage location 2, Pacific Northwest Research Station. See DAMLOC1_PNWRS. Only collected by certain FIA work units (SURVEY.RSCD = 26).

128. DIACHECK_PNWRS

Diameter check, Pacific Northwest Research Station. A separate estimate of the diameter without the obstruction if the diameter was estimated because of moss/vine/obstruction, etc. Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

129. DMG_AGENT1_CD_PNWRS

Damage agent 1, Pacific Northwest Research Station. Primary damage agent code in PNW. Up to three damaging agents can be coded in PNW as DMG_AGENT1_CD_PNWRS, DMG_AGENT2_CD_PNWRS, and DMG_AGENT3_CD_PNWRS. A code indicating the tree damaging agent that is considered to be of greatest importance to predict tree growth, survival, and forest composition and structure. Additionally, there are two classes of damaging agents. Class I damage agents are considered more important than class II agents and are thus coded as a primary agent before the class II agents. For more information, see appendix K. Only collected by certain FIA work units (SURVEY.RSCD = 26).

130. DMG_AGENT2_CD_PNWRS

Damage agent 2, Pacific Northwest Research Station. See DMG_AGENT1_CD_PNWRS. Only collected by certain FIA work units (SURVEY.RSCD = 26).

131. DMG_AGENT3_CD_PNWRS

Damage agent 3, Pacific Northwest Research Station. Damage Agent is a 2-digit code with values 01 to 91. Only collected by certain FIA work units (SURVEY.RSCD = 26).

132. MIST_CL_CD_PNWRS

Leafy mistletoe class code, Pacific Northwest Research Station. All juniper species, incense cedars, white fir (CA only) and oak trees are rated for leafy mistletoe infection. This item is used to describe the extent and severity of

leafy mistletoe infection (see MIST_CL_CD for dwarf mistletoe information). Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

133. SEVERITY1_CD_PNWRS

Damage severity 1, Pacific Northwest Research Station for years 2001-2004. Damage severity depends on the damage agent coded (see appendix K for codes). This is a 2-digit code that indicates either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-9 depending on the specific Damage Agent). Only collected by certain FIA work units (SURVEY.RSCD = 26).

134. SEVERITY1A_CD_PNWRS

Damage severity 1A, Pacific Northwest Research Station. Damage severity depends on the damage agent coded (see appendix K for codes). This is a 2-digit code indicating either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-4 depending on the specific Damage Agent). Only collected by certain FIA work units (SURVEY.RSCD = 26).

135. SEVERITY1B_CD_PNWRS

Damage severity 1B, Pacific Northwest Research Station. Damage severity B is only coded when the Damage Agent is white pine blister rust (36). Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

136. SEVERITY2_CD_PNWRS

Damage severity 2, Pacific Northwest Research Station for years 2001-2004. Damage severity depends on the damage agent coded (see appendix K for codes). This is a 2-digit code indicating either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-9 depending on the specific Damage Agent). Only collected by certain FIA work units (SURVEY.RSCD = 26).

137. SEVERITY2A_CD_PNWRS

Damage severity 2A, Pacific Northwest Research Station starting in 2005. See SEVERITY1A_CD_PNWRS. Only collected by certain FIA work units (SURVEY.RSCD = 26).

138. SEVERITY2B_CD_PNWRS

Damage severity 2B, Pacific Northwest Research Station starting in 2005. See SEVERITY1B_CD_PNWRS. Only collected by certain FIA work units (SURVEY.RSCD = 26).

139. SEVERITY3_CD_PNWRS

Damage severity 3, Pacific Northwest Research Station for years 2001-2004. Damage severity depends on the damage agent coded (see appendix K for codes). This is a 2-digit code indicating either percent of location damaged (01-99), or the appropriate class of damage (values vary from 0-9 depending on the specific Damage Agent). Only collected by certain FIA work units (SURVEY.RSCD = 26).

140. UNKNOWN_DAMTYP1_PNWRS

Unknown damage type 1, Pacific Northwest Research Station. A code indicating the sign or symptom recorded when UNKNOWN damage code 90 is used. Only collected by certain FIA work units (SURVEY.RSCD = 26).

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

141. UNKNOWN_DAMTYP2_PNWRS

Unknown damage type 2, Pacific Northwest Research Station. See UNKNOWN_DAMTYP1_PNWRS. Only collected by certain FIA work units (SURVEY.RSCD = 26).

142. PREV_PNTN_SRS

Previous periodic prism number, tree number, Southern Research Station. In some older Southeast Experiment Station states, the prism point, tree number (PNTN) of the current cycle did not match the previous cycle's prism point, tree number. PREV_PNTN_SRS is used to join the current and the previous prism plot trees.

143. DISEASE_SRS Disease, Southern Research Station. A code indicating the incidence of fusiform, commandra rust or dieback. Dieback is only recorded for live hardwood trees where DIA ≥5 inches with at least 10 percent dieback. Fusiform and comandra rust are only recorded for live pine trees ≥5 inches with the following species codes: 110, 111, 121, 126, 128, or 131. Populated for all forested plots using the National Field Guide protocols (MANUAL 1.6 – 5.1). Only collected by certain FIA work units (SURVEY.RSCD = 33).

Code	Description
0	None.
1	Fusiform/Commandra rust on species codes 110, 111, 121, 126, 128, and 131, based on any incidence of cankers within 12 inches of the stem.
2	Hardwood dieback of 10% or more of the crown area. Not recorded on overtopped trees.

144. DIEBACK_SEVERITY_SRS

Dieback severity, Southern Research Station. A code indicating the severity of hardwood crown dieback. Populated when DISEASE_SRS = 2. Populated for all forested plots using the National Field Guide protocols (MANUAL 1.6 – 5.1). Only collected by certain FIA work units (SURVEY.RSCD = 33).

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

145. DAMAGE_AGENT_CD1

Damage agent code 1. *(Core: all live tally trees ≥5.0 inches d.b.h/d.r.c; Core optional: All live tally trees ≥1.0 inches d.b.h/d.r.c.)* A code indicating the first damage agent observed when inspecting the tree from bottom to top (roots, bole, branches, foliage). If more than one agent is observed, the most threatening one is listed first where agents threatening survival are listed first and agents threatening wood quality second. The codes used for damage agents come from the January 2012 Pest Trend Impact Plot System (PTIPS) list from the Forest Health Technology Enterprise Team (FHTET) that has been modified to meet FIA's needs. The list is modified by each region to meet the specific needs of that region. The general agent codes are listed here. See appendix J for the complete list of codes.

Code	General Agent	Damage Threshold*	Descriptions
0		No damage	
10000	General insects	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Insect damage that cannot be placed in any of the following insect categories.
11000	Bark beetles	Any evidence of a successful attack (successful attacks generally exhibit boring dust, many pitch tubes and/or fading crowns).	Bark beetles (*Dendroctonus*, *Ips*, and other genera) are phloem-feeding insects that bore through the bark and create extensive galleries between the bark and the wood. Symptoms of beetle damage include fading or discolored tree crown (yellow or red), pitch tubes or pitch streaks on the bark, extensive egg galleries in the phloem, boring dust in the bark crevices or at the base of the tree. Bark chipping by woodpeckers may be conspicuous. They inflict damage or destroy all parts of trees at all stages of growth by boring in the bark, inner bark, and phloem. Visible signs of attack include pitch tubes or large pitch masses on the tree, dust and frass on the bark and ground, and resin streaming. Internal tunneling has various patterns. Most have tunnels of uniform width with smaller galleries of variable width radiating from them. Galleries may or may not be packed with fine boring dust.
12000	Defoliators	Any damage to the terminal leader; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	These are foliage-feeding insects that may reduce growth and weaken the tree causing it to be more susceptible to other damaging agents. General symptoms of defoliation damage include large amounts of missing foliage, browning foliage, extensive branch mortality, or dead tree tops.
13000	Chewing insects	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

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

Code	General Agent	Damage Threshold*	Descriptions
			(such as insects), wind throw, and stem breakage.
22000	Cankers (non-rust)	Any occurrence.	A canker -- a sunken lesion on the stem caused by the death of cambium -- may cause tree breakage or kill the portion of the tree above the canker. Cankers may be caused by various agents but are most often caused by fungi. A necrotic lesion begins in the bark of branches, trunk or roots, and progresses inward killing the cambium and underlying cells. The causal agent may or may not penetrate the wood. This results in areas of dead tissue that become deeper and wider. There are two types of cankers, annual and perennial. Annual cankers enlarge only once and do so within an interval briefer than the growth cycle of the tree, usually less than one year. Little or no callus is associated with annual cankers, and they may be difficult to distinguish from mechanical injuries. Perennial cankers are usually the more serious of the two, and grow from year to year with callus forming each year on the canker margin, often resulting in a target shape. The most serious non-rust cankers occur on hardwoods, although branch mortality often occurs on conifers.
22500	Stem decays	Any visual evidence (conks; fruiting bodies; rotten wood)	Rot occurring in the bole/stems of trees above the roots and stump.
23000	Parasitic / Epiphytic plants	Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes and vines covering ≥ 50% of crown.	Parasitic and epiphytic plants can cause damage to trees in a variety of ways. The most serious ones are dwarf mistletoes, which reduce growth and can cause severe deformities. Vines may damage trees by strangulation, shading, or physical damage. Benign epiphytes, such as lichens or mosses, are not considered damaging agents.
24000	Decline Complexes/ Dieback/Wilts	Damage ≥ 20% dieback of crown area.	Tree disease which results not from a single causal agent but from an interacting set of factors. Terms that denote the symptom syndrome, such as dieback and wilt, are commonly used to identify these diseases**.**
25000	Foliage diseases	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Foliage diseases are caused by fungi and result in needle shed, growth loss, and, potentially, tree mortality. This category includes needle casts, blights, and needle rusts.
26000	Stem rusts	Any occurrence on the bole or stems	A stem rust is a disease caused by

Code	General Agent	Damage Threshold*	Descriptions
		(on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥20% of branches	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	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
		the foliage with ≥50% of the leaf/needle affected.	
42000	Domestic animals	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Open wounds caused by cattle and horses occur on the roots and lower trunk. Soil compaction from the long term presence of these animals in a woodlot can also cause indirect damage.
50000	Abiotic	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	Abiotic damages are those that are not caused by other organisms. In some cases, the type and severity of damage may be similar for different types of agents (e.g., broken branches from wind, snow, or ice).
60000	Competition	Overtopped shade intolerant trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC).	Suppression of overtopped shade intolerant species. Trees that are not expected to survive for 5 years or saplings not expected to reach tree size (5.0 inches DBH/DRC).
70000	Human activities	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	People can injure trees in a variety of ways, from poor pruning, to vandalism, to logging injury. Signs include open wounds or foreign embedded objects.
71000	Harvest	Removal of ≥10% of cubic volume	Only recorded for woodland species trees that have partial cutting
90000	Other damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	
99000	Unknown damage	Any damage to the terminal leader; damage ≥20% of the roots or boles with> 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the	Use this code only when observed damage cannot be attributed to a general or specific agent.

Code	General Agent	Damage Threshold*	Descriptions
		circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected.	

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

146. DAMAGE_AGENT_CD2

Damage agent code 2. *(Core: all live tally trees ≥ 5.0 inches d.b.h/d.r.c; Core optional: All live tally trees ≥ 1.0 inches d.b.h/d.r.c.)* See DAMAGE_AGENT_CD1.

147. DAMAGE_AGENT_CD3

Damage agent code 3. *(Core: all live tally trees ≥ 5.0 inches d.b.h/d.r.c; Core optional: All live tally trees ≥ 1.0 inches d.b.h/d.r.c.)* See DAMAGE_AGENT_CD1.

148. CENTROID_DIA

Centroid diameter. The outside bark diameter (in inches) measured at CENTROID_DIA_HT_ACTUAL. For tree ferns, diameter is measured where the fronds emerge from the trunk. Only collected by certain FIA work units (SURVEY.RSCD=26) for the Pacific Islands. This diameter is part of a new upper stem diameter protocol that began with remeasurement, except for Hawaii where the protocol was implemented in the first measurement.

149. CENTROID_DIA_HT

Calculated centroid diameter height. The height (in feet) to stem centroid. The stem centroid is located at 30 percent of the TOTAL LENGTH of the stem. Only collected by certain FIA work units (SURVEY.RSCD=26) for the Pacific Islands. This height is part of a new upper stem diameter protocol that began with the first remeasurement, except for Hawaii where the protocol was implemented in the first measurement.

150. CENTROID_DIA_HT_ACTUAL

Actual centroid diameter height. The height (in feet) to where stem centroid diameter was actually measured. It may differ from CENTROID_DIA_HT if abnormalities in the stem prevented a normal diameter measurement. Only collected by certain FIA work units (SURVEY.RSCD=26) for the Pacific Islands. This height is part of a new upper stem diameter protocol that began with the first remeasurement, except for Hawaii where the protocol was implemented in the first measurement.

151. UPPER_DIA Upper stem diameter. The outside bark upper stem diameter (in inches), measured at least 3 feet above the point where the DIA was taken. For larger

trees, UPPER_DIA was recorded at the point where the main stem was at least 4 inches in diameter. This diameter is used in the calculation of stem taper, needed to improve the estimation of stem volume. Only collected by certain FIA work units (SURVEY.RSCD=26) for the Pacific Islands. This is the legacy upper stem diameter protocol and will not be collected after the first remeasurement.

152. UPPER_DIA_HT

Upper stem diameter height. The height (in feet) to where upper stem diameter (UPPER_DIA) was measured. Only collected by certain FIA work units (SURVEY.RSCD=26) for the Pacific Islands. This is the legacy upper stem diameter protocol and will not be collected after the first remeasurement.

Tree Net Growth, Removal, and Mortality Estimation Table (Oracle table name is TREE_GRM_ESTN)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	STATECD	State code	NUMBER
3	INVYR	Inventory year	NUMBER(4)
4	PLT_CN	Plot sequence number	VARCHAR2(34)
5	TRE_CN	Tree sequence number	VARCHAR2(34)
6	LAND_BASIS	Land basis for estimate	VARCHAR2(10)
7	ESTIMATE	Base attribute that is being estimated	VARCHAR2(20)
8	ESTN_TYPE	Estimation type of the tree	VARCHAR2(10)
9	ESTN_UNITS	Estimation units	VARCHAR2(3)
10	COMPONENT	Growth component type	VARCHAR2(15)
11	SUBTYP_GRM	Subplot type used for GRM estimation	NUMBER(1)
12	REMPER	Remeasurement period	NUMBER(3,1)
13	TPAGROW_UNADJ	Growth trees per acre unadjusted	NUMBER(11,6)
14	TPAREMV_UNADJ	Removal trees per acre per year unadjusted	NUMBER(11,6)
15	TPAMORT_UNADJ	Mortality trees per acre per year unadjusted	NUMBER(11,6)
16	ANN_NET_GROWTH	Average annual net growth estimate	NUMBER(13,6)
17	REMOVALS	Removal estimate	NUMBER(13,6)
18	MORTALITY	Mortality estimate	NUMBER(13,6)
19	EST_BEGIN	Beginning estimate	NUMBER(13,6)
20	EST_BEGIN_RECALC	Recalculated beginning estimate	VARCHAR2(1)
21	EST_END	Ending estimate	NUMBER(13,6)
22	EST_MIDPT	Midpoint estimate	NUMBER(13,6)
23	EST_THRESHOLD	Threshold estimate	NUMBER(13,6)
24	DIA_BEGIN	Beginning diameter	NUMBER(5,2)
25	DIA_BEGIN_RECALC	Recalculated diameter	VARCHAR2(1)
26	DIA_END	Ending diameter	NUMBER(5,2)
27	DIA_MIDPT	Midpoint diameter	NUMBER(5,2)
28	DIA_THRESHOLD	Threshold diameter	NUMBER(5,2)
29	G_S	Survivor growth	NUMBER(13,6)
30	I	Ingrowth	NUMBER(13,6)
31	G_I	Growth on ingrowth	NUMBER(13,6)
32	M	Mortality	NUMBER(13,6)
33	G_M	Mortality growth	NUMBER(13,6)
34	C	Cut	NUMBER(13,6)
35	G_C	Cut growth	NUMBER(13,6)

	Column name	Descriptive name	Oracle data type
36	R	Reversion	NUMBER(13,6)
37	G_R	Reversion growth	NUMBER(13,6)
38	D	Diversion	NUMBER(13,6)
39	G_D	Diversion growth	NUMBER(13,6)
40	CD	Cull decrement	NUMBER(13,6)
41	G_CD	Cull decrement growth	NUMBER(13,6)
42	CI	Cull increment	NUMBER(13,6)
43	G_CI	Cull increment growth	NUMBER(13,6)
44	CREATED_BY	Created by	VARCHAR2(30)
45	CREATED_DATE	Created date	DATE
46	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
47	MODIFIED_BY	Modified by	VARCHAR2(30)
48	MODIFIED_DATE	Modified date	DATE
49	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s)	Tables to link	Abbreviated notation
Primary	CN	N/A	TGE_PK
Unique	TRE_CN, LAND_BASIS, ESTIMATE, ESTN_TYPE, ESTN_UNITS	N/A	TGE_UK
Foreign	PLT_CN	TREE_GRM_ESTN to PLOT	TGE_PLT_FK
Foreign	TRE_CN	TREE_GRM_ESTN to TREE	TGE_TRE_FK

This table stores information used to compute net growth, removal, and mortality (GRM) estimates on remeasurement tree records. This includes the detailed land basis, component, estimation type, estimation units, as well as the begin, end, and mid-point diameters and the begin, end, and mid-point estimates. In addition, the standard net growth, removal, and mortality estimates are included, as well as estimates for each individual growth component. Users should note that this table usually includes multiple records for each remeasurement tree. For volume estimates, there are generally three records storing estimates for each estimation type (all live, growing-stock, sawlog) for each land basis (forestland or timberland). However, if the estimation type is not applicable to the tree (e.g., the tree is not growing-stock form or is not sawlog size), then there could be only one record for each land basis (all live). Currently, this table only stores GRM estimates for volume. Future enhancements could include biomass and carbon as well as additional estimate types such as sawlog tops, tops and limbs, stumps, etc.

1. CN Sequence number. A unique sequence number used to identify a tree GRM estimation record.

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

3. INVYR Inventory year. See SURVEY.INVYR description for definition.

4. PLT_CN Plot sequence number. Foreign key linking the GRM tree estimation record to the plot record.

5. TRE_CN Tree sequence number. Foreign key linking the GRM tree estimation record to the tree record.

6. LAND_BASIS Land basis for estimate. An attribute that categorizes estimates by the land-based domain of interest.

Value	Description
FORESTLAND	Land that is at least 10 percent stocked by forest trees of any size, or land formerly having such tree cover, and is not currently developed for a nonforest use. The minimum area for classification as forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must have a crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams and other bodies of water, or natural clearings in forested areas shall be classified as forest, if < 120 feet in width or 1.0 acre in size. Forest land is divided into timberland, reserved forest land, and other forest land (such as woodland) (Smith et al. 2004b, U.S. Department of Agriculture Forest Service 2007g).
TIMBERLAND	Forest land that is producing or capable of producing 20 cubic feet per acre or more per year of wood at culmination of mean annual increment (MAI). Timberland excludes reserved forest lands.

7. ESTIMATE Base attribute that is being estimated. Currently, the only GRM base attribute is volume (ESTIMATE = 'VOLUME'). Future enhancements could include biomass and carbon.

8. ESTN_TYPE Tree estimation type. A code indicating whether the estimation record is for all live, growing-stock, or sawlog trees.

Code	Description
AL	All live
GS	Growing-stock
SL	Sawlog

9. ESTN_UNITS Estimation units. A code indicating the units for the estimation record.

Code	Description
CF	Cubic feet
BF	Board feet

10. COMPONENT Component of growth. A code indicating the type of change that occurred on the tree between the previous and the current field observations.

Code	Description
SURVIVOR	Live tree in estimate at two points in time.
INGROWTH	Tree grew across minimum threshold diameter for a given estimate and/or estimation type.
MORTALITY1	Tree was previously in estimate and died of natural causes (TREE.AGENTCD <> 80).

Code	Description
MORTALITY2	Tree grew across minimum threshold diameter for a given estimate and/or estimation type and died of natural causes (TREE.AGENTCD <> 80).
CUT1	Tree was previously in estimate and was killed by harvesting activity (TREE.AGENTCD = 80).
CUT2	Tree grew across minimum threshold diameter for a given estimate and/or estimation type and was killed by harvesting activity (TREE.AGENTCD = 80).
REVERSION1	Tree grew across minimum threshold diameter for a given estimate and/or estimation type by the midpoint of the measurement interval and the condition reverted to the land basis.
REVERSION2	Tree grew across minimum threshold diameter for a given estimate and/or estimation type after the midpoint of the measurement interval and the condition reverted to the land basis.
DIVERSION 1	Tree was previously in estimate and the condition diverted from the land basis.
DIVERSION2	Tree grew across minimum threshold diameter for a given estimate and/or estimation type and the condition diverted from the land basis.
CULLINCR	Not used at this time.
CULLDECR	Not used at this time.
N/A-P2A	Component value is not available for periodic-to-annual remeasurement trees.
N/A-PERIODIC	Component value is not available for periodic remeasurement trees.

11. SUBTYP_GRM

Subplot type used for GRM estimation. A code indicating what plot type is used for assigning the tree per acre value, and which population adjustment factor is used for GRM estimates.

Code	Description
1	Subplot
2	Microplot
3	Macroplot

12. REMPER

Remeasurement period. The number of years between measurements for remeasured plots. This attribute is null (blank) for new plots or remeasured plots that are not used for growth, removals, or mortality estimates. For data processed with NIMS, REMPER, remeasurement period, is the number of years between measurements (to the nearest 0.1 year). For data processed with systems other than NIMS, remeasurement period is based on the number of growing seasons between measurements. Allocation of parts of the growing season by month is different for each FIA work unit. Contact the appropriate FIA work unit for information on how this is done for a particular State. **Note**: It is not valid to use REMPER to estimate periodic change.

13. TPAGROW_UNADJ

Growth trees per acre unadjusted. The number of growth trees per acre that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD = 1), TPAGROW_UNADJ is set to a constant derived from the plot size. Variable-radius plots were often used in earlier inventories, so the value in TPAGROW_UNADJ decreases as the tree diameter increases. This attribute will be blank (null) if the tree does not contribute to growth estimates. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive

population estimates. Examples of estimating population totals are shown in chapter 4.

14. TPAREMV_UNADJ

    Removal trees per acre per year unadjusted. The number of removal trees per acre per year that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD =1), TPAREMV_UNADJ is set to a constant derived from the plot size divided by PLOT.REMPER. Variable-radius plots were often used in earlier inventories, so the value in TPAREMV_UNADJ decreases as the tree diameter increases. This attribute will be blank (null) if the tree does not contribute to removals estimates. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

15. TPAMORT_UNADJ

    Mortality trees per acre per year unadjusted. The number of mortality trees per acre per year that the sample tree theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD =1), TPAMORT_UNADJ is set to a constant derived from the plot size divided by PLOT.REMPER. Variable-radius plots were often used in earlier inventories, so the value in TPAMORT_UNADJ decreases as the tree diameter increases. This attribute will be blank (null) if the tree does not contribute to mortality estimates. Based on the procedures described in Bechtold and Patterson (2005), this attribute must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

16. ANN_NET_GROWTH

    Average annual net growth estimate. The net change in the estimate per year of this tree. Because this value is net growth, it may be a negative number. Negative values are usually due to mortality but can also occur on live trees that have a net loss because of damage, rot, broken top, or other causes. To expand to a per acre value, multiply by TPAGROW_UNADJ.

17. REMOVALS Removal estimate. The trees that were cut, utilized or not, and trees removed from the land basis (diversion) between time 1 and time 2. The estimate is calculated for the mid-point of the measurement interval.

18. MORTALITY Mortality estimate. The trees that died between time 1 and time 2. The estimate is calculated for the mid-point of the measurement interval.

19. EST_BEGIN Beginning estimate. Estimate derived from original field observations at time 1, modeled time 1 values for missing trees (TREE.RECONILECD 3 or 4), or recomputed time 1 variables.

20. EST_BEGIN_RECALC

Recalculated beginning estimate. A code indicating when EST_BEGIN is different (i.e., recalculated) from the time 1 estimate for the purpose of calculating growth. EST_BEGIN is recalculated when any of the follow occur:

TREE.DIACHECK = 2 at time 2
TREE.SPCD observed at time 1 <> TREE.SPCD observed at time 2
TREE.STATUSCD = 2 and TREE.STANDING_DEAD_CD = 1 at time 1 but
TREE.STATUSCD = 1 at time 2
TREE.TREECLCD = 3 or 4 at time 1 but TREE.TREECLCD = 2 at time 2

Code	Description
Y	EST_BEGIN is recalculated.
N	EST_BEGIN is from time 1 field observations or derived from modeled time 1 values for missing trees.

21. EST_END Ending estimate. Estimate at time 2.

22. EST_MIDPT Midpoint estimate. Estimate at midpoint of measurement interval. Only calculated for removal and mortality trees.

23. EST_THRESHOLD

Threshold estimate. Estimate at threshold size.

24. DIA_BEGIN Beginning diameter. Diameter from original field observations at time 1, modeled time 1 diameter for missing trees (TREE.RECONILECD 3 or 4), or recomputed time 1 diameter based on time 2 observations (see DIA_BEGIN_RECALC).

25. DIA_BEGIN_RECALC

Recalculated diameter. A code indicating when DIA_BEGIN is different (i.e., recalculated) from the time 1 diameter for the purpose of calculating growth. DIA_BEGIN is recalculated when TREE.DIACHECK = 2 and time 2.

Code	Description
Y	DIA_BEGIN is recalculated.
N	DIA_BEGIN is from time 1 field diameter or derived from modeled time 1 diameter for missing trees.

26. DIA_END Ending diameter. Diameter at time 2.

27. DIA_MIDPT Midpoint diameter. Diameter at midpoint of measurement interval.

28. DIA_THRESHOLD

Threshold diameter. Diameter at threshold size.

29. G_S Survivor growth. The growth on trees tallied at time 1 that survive until time 2.

30. I — Ingrowth. The estimate of trees at the time that they grow across the diameter threshold between time 1 and time 2. This term also includes trees that subsequently die (i.e., ingrowth mortality), are cut (i.e., ingrowth cut), or diverted to nonforest (i.e., ingrowth diversion); as well as trees that achieve the threshold after an area reverts to a forest land use (i.e., reversion ingrowth).

31. G_I — Growth on ingrowth. The growth of trees between the time they grow across the diameter threshold and time 2.

32. M — Mortality. The estimate of trees that die from natural causes between time 1 and time 2. The estimate is based on tree size at the midpoint of the measurement interval (includes mortality growth).

33. G_M — Mortality growth. The growth of trees that died from natural causes between time 1 and the midpoint of the measurement interval. This term also includes the subsequent growth on ingrowth trees that achieve the diameter threshold prior to mortality.

34. C — Cut. The estimate of trees cut between time 1 and time 2. The estimate is based on tree size at the midpoint of the measurement interval (includes cut growth). Trees felled or killed in conjunction with a harvest or silvicultural operation (whether they are utilized or not) are included, but trees on land diverted from forest to nonforest (diversions) are excluded.

35. G_C — Cut growth. The growth of cut trees between time 1 and the midpoint of the measurement interval. This term also includes the growth on ingrowth trees that achieve the diameter threshold prior to being cut.

36. R — Reversion. The estimate of trees on land that reverts from a nonforest land use to a forest land use or land that reverts from any source to timberland between time 1 and time 2. The estimate is based on tree size at the midpoint of the measurement interval.

37. G_R — Reversion growth. The growth of reversion trees from the midpoint of the measurement interval to time 2. This term also includes the growth on ingrowth trees that achieve the diameter threshold after reversion.

38. D — Diversion. The estimate of trees on forest land diverted to nonforest, or timberland diverted to reserved forest land and other unproductive forest land, whether the tree is utilized or not, between time 1 and time 2. The estimate is based on tree size at the midpoint of the measurement interval (includes diversion growth).

39. G_D Diversion growth. The growth of diversion trees from time 1 to the midpoint of the measurement interval. This term also includes the growth on ingrowth trees that achieve the diameter threshold prior to diversion.

40. CD Cull decrement. (*Core optional*) The net gain in the growing-stock component due to reclassification of cull trees to growing-stock trees between two surveys (i.e., the estimate of trees that were given a cull code at time 1, but reclassified with a growing-stock code at time 2). The estimate is based on tree size at the midpoint of the measurement interval.

41. G_CD Cull decrement growth. *(Core optional)* The growth from the midpoint of the measurement interval to time 2 on trees that were cull at time 1, but growing-stock at time 2.

42. CI Cull increment. *(Core optional)* The net reduction in the growing-stock component due to reclassification of growing-stock trees to cull trees between two surveys (i.e., the estimate of trees that were given a growing-stock code at time 1, but reclassified with a cull code at time 2). The estimate is based on tree size at the midpoint of the measurement interval (includes cull increment growth).

43. G_CI Cull increment growth. *(Core optional)* The growth to the midpoint of the measurement interval between time 1 and 2 of trees that were given a growing-stock code at time 1, but reclassified with a cull code at time 2.

44. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

45. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

46. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

47. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

48. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

49. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Begin and End Table (Oracle table name is BEGINEND)

	Column name	Descriptive name	Oracle data type
1	ONEORTWO	One or two	NUMBER
2	CREATED_BY	Created by	VARCHAR2(30)
3	CREATED_DATE	Created date	DATE
4	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
5	MODIFIED_BY	Modified by	VARCHAR2(30)
6	MODIFIED_DATE	Modified date	DATE
7	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

1. ONEORTWO One or two. A counter to establish how many times to access a tree record in the TREE_GRM_ESTN table. This attribute is used when calculating net growth accounting estimates. It should not be used when summarizing net growth attributes stored in the TREE table (i.e., when not summarizing by the accounting temporal basis). The first time the record is accessed, TREE_GRM_ESTN.EST_BEGIN is acquired along with the classification attribute value at time 1. The second time the record is accessed, TREE_GRM_ESTN.EST_END is acquired along with the classification attribute value at time 2. If TREE_GRM_ESTN.EST_END is null, then TREE_GRM_ESTN.EST_MIDPT is substituted. See chapter 4 for examples of use.

2. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

3. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

4. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

5. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

6. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

7. MODIFIED_IN_INSTANCE

   Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Tree Regional Biomass Table (Oracle table name is TREE_REGIONAL_BIOMASS)

	Column name	Descriptive name	Oracle data type
1	TRE_CN	Tree sequence number	VARCHAR2(34)
2	STATECD	State code	NUMBER(4)
3	REGIONAL_DRYBIOT	Regional total tree biomass oven-dry weight	NUMBER(13,6)
4	REGIONAL_DRYBIOM	Regional merchantable stem biomass oven-dry weight	NUMBER(13,6)
5	CREATED_BY	Created by	VARCHAR2(30)
6	CREATED_DATE	Created date	DATE
7	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
8	MODIFIED_BY	Modified by	VARCHAR2(30)
9	MODIFIED_DATE	Modified date	DATE
10	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	TRE_CN	N/A	TRB_PK
Foreign	TRE_CN	TREE_REGIONAL_BIOMASS to TREE	TRB_TRE_FK

This table provides biomass estimates of live and dead trees 1 inch in diameter and larger using equations and methods that vary by FIA work unit. Both REGIONAL_DRYBIOT and REGIONAL_DRYBIOM preserve the original data and computation procedures used by FIA work units to calculate DRYBIOT and DRYBIOM in previous versions of FIADB. Users should be aware that for some FIA work units, these biomass estimates may not include bark. Biomass estimates in this table will differ from biomass estimates found on the TREE table records because components such as bark, stump, and top (with branches) are now being stored on the TREE table are derived by applying ratios to stem biomass. The TREE table will be the source of biomass data used in official reporting. However, the TREE_REGIONAL_BIOMASS table contains valuable information for generating biomass estimates that match earlier published reports.

1. TRE_CN — Tree sequence number. Foreign key linking the tree regional biomass record to the tree record.

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

3. REGIONAL_DRYBIOT

   Regional dry total biomass (pounds). The total aboveground biomass of a sample tree 1.0 inch diameter or larger, for live trees and 5.0 inches diameter or larger for dead trees, including all tops and limbs (but excluding foliage). This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Calculated in oven-dry pounds per tree. This field should have an entry if DIA is 1.0 inch or larger (5.0 inches or larger for dead trees), regardless of TREECLCD; zero otherwise. For dead or cut trees, this number

represents the biomass at the time of death or last measurement. Because total biomass has been calculated differently among FIA work units, contact the appropriate FIA work units (see table 4) for information on how biomass was estimated and whether bark was included.

4. REGIONAL_DRYBIOM

   Regional dry merchantable stem biomass (pounds). The total gross biomass (including bark) of a tree 5.0 inches DBH or larger from a 1-foot stump to a minimum 4-inch top diameter of the central stem. This is a per tree value and must be multiplied by TPA_UNADJ to obtain per acre information. Calculated in oven-dry pounds per tree. This field should have an entry if DIA is 5.0 inches or larger, regardless of STATUSCD or TREECLCD; zero otherwise. For dead or cut trees, this number represents the biomass at the time of death or last measurement. Because total biomass has been calculated differently among FIA work units, contact the appropriate FIA work unit (see table 4) for information on how biomass was estimated and whether bark was actually included.

5. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

6. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

7. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

8. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

9. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

10. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Seedling Table (Oracle table name is SEEDLING)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	UNITCD	Unit code	NUMBER(2)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER(5)
8	SUBP	Subplot number	NUMBER(3)
9	CONDID	Condition class number	NUMBER(1)
10	SPCD	Species code	NUMBER
11	SPGRPCD	Species group code	NUMBER(2)
12	STOCKING	Tree stocking	NUMBER(7,4)
13	TREECOUNT	Tree count for seedlings	NUMBER(3)
14	TOTAGE	Total age	NUMBER(3)
15	CREATED_BY	Created by	VARCHAR2(30)
16	CREATED_DATE	Created date	DATE
17	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
18	MODIFIED_BY	Modified by	VARCHAR2(30)
19	MODIFIED_DATE	Modified date	DATE
20	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
21	TREECOUNT_CALC	Tree count used in calculations	NUMBER
22	TPA_UNADJ	Trees per acre unadjusted	NUMBER(11,6)
23	CYCLE	Inventory cycle number	NUMBER(2)
24	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of key	Column(s)	Tables to link	Abbreviated notation
Primary	CN	N/A	SDL_PK
Unique	PLT_CN, SUBP, CONDID, SPCD	N/A	SDL_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, SUBP, CONDID, SPCD	N/A	SDL_NAT_I
Foreign	PLT_CN	SEEDLING to PLOT	SDL_PLT_FK

Seedling data collection overview – When PLOT.MANUAL <2.0, the national core procedure was to record the actual seedling count up to six seedlings and then record 6+ if at least six seedlings were present. However, the following regions collected the actual seedling count when PLOT.MANUAL <2.0: Rocky Mountain Research Station (RMRS) and North Central Research Station (NCRS). If PLOT.MANUAL <2.0 and TREECOUNT is blank (null), then a value of 6 in TREECOUNT_CALC represents 6 or more seedlings. In the past, seedlings were often tallied in FIA inventories only to the extent necessary to determine if some minimum number were present, which means that seedlings were often under-reported. **Note**: The SEEDLING record may not exist for some periodic inventories.

1. CN — Sequence number. A unique index used to easily identify a seedling.
2. PLT_CN — Plot sequence number. Foreign key linking the seedling record to the plot record.
3. INVYR — Inventory year. See SURVEY.INVYR description for definition.
4. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B.
5. UNITCD — Survey unit number. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.
6. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix B for codes.
7. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.
8. SUBP — Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).
9. CONDID — Condition class number. The unique identifying number assigned to a condition on which the seedling is located. See COND.CONDID for details on the attributes which delineate a condition.
10. SPCD — Species code. An FIA species code. Refer to appendix F for codes.
11. SPGRPCD — Species group code. A code assigned to each tree species in order to group them for reporting purposes on presentation tables. Codes and their associated names (see REF_SPECIES_GROUP.NAME) are shown in appendix E. Individual tree species and corresponding species group codes are shown in appendix F.
12. STOCKING — Tree stocking. The stocking value assigned to each count of seedlings, by species. Stocking is a relative term used to describe (in percent) the adequacy of a given stand density in meeting a specific management objective. Species or forest type stocking functions were used to assess the stocking contribution of seedling records. These functions, which were developed using stocking

guides, relate the area occupied by an individual tree to the area occupied by a tree of the same size growing in a fully stocked stand of like trees. The stocking of seedling count records is used in the calculation of COND.GSSTKCD and COND.ALSTKCD on the condition record.

13. TREECOUNT Tree count (for seedlings). Indicates the number of seedlings (DIA <1.0 inch) present on the microplot. Conifer seedlings are at least 6 inches tall and hardwood seedlings are at least 12 inches tall. When PLOT.MANUAL <2.0, the national core procedure was to record the actual seedling count up to six seedlings and then record 6+ if at least six seedlings were present. However, the following regions collected the actual seedling count when PLOT.MANUAL <2.0: Rocky Mountain Research Station (RMRS) and North Central Research Station (NCRS). If PLOT.MANUAL <2.0 and TREECOUNT is blank (null), then a value of 6 in TREECOUNT_CALC represents 6 or more seedlings.

14. TOTAGE Total age. The seedling's total age. Total age is collected for a subset of seedling count records, using one representative seedling for the species. The age is obtained by counting the terminal bud scars or the whorls of branches and may be used in the stand age calculation. Only collected by certain FIA work units (SURVEY.RSCD = 22). This attribute may be blank (null) for SURVEY.RSCD = 22 and is always null for the other FIA work units.

15. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

16. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

17. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

18. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

19. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

20. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

21. TREECOUNT_CALC

Tree count used in calculations. This attribute is set either to COUNTCD, which was dropped in FIADB version 2.1, or TREECOUNT. When PLOT.MANUAL <2.0, the national core procedure was to record the actual seedling count up to six seedlings and then record 6+ if at least six seedlings were present. However, the following regions collected the actual seedling count when PLOT.MANUAL <2.0: Rocky Mountain Research Station (RMRS) and North Central Research Station (NCRS). If PLOT.MANUAL <2.0 and TREECOUNT is blank (null), then a value of 6 in TREECOUNT_CALC represents 6 or more seedlings.

22. TPA_UNADJ Trees per acre unadjusted. The number of seedlings per acre that the seedling count theoretically represents based on the sample design. For fixed-radius plots taken with the mapped plot design (PLOT.DESIGNCD =1), TPA_UNADJ equals 74.965282 times the number of seedlings counted. For plots taken with other sample designs, this attribute may be blank (null). Based on the procedures described in Bechtold and Patterson (2005), this attribute can be adjusted using factors stored on the POP_STRATUM table to derive population estimates. Examples of estimating population totals are shown in chapter 4.

23. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

24. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

Site Tree Table (Oracle table name is SITETREE)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	PREV_SIT_CN	Previous site tree sequence number	VARCHAR2(34)
4	INVYR	Inventory year	NUMBER(4)
5	STATECD	State code	NUMBER(4)
6	UNITCD	Survey unit code	NUMBER(2)
7	COUNTYCD	County code	NUMBER(3)
8	PLOT	Phase 2 plot number	NUMBER(5)
9	CONDID	Condition class number	NUMBER(1)
10	TREE	Tree number	NUMBER(9)
11	SPCD	Species code	NUMBER
12	DIA	Diameter	NUMBER(5,2)
13	HT	Total height	NUMBER(3)
14	AGEDIA	Tree age at diameter	NUMBER(3)
15	SPGRPCD	Species group code	NUMBER(2)
16	SITREE	Site index for the tree	NUMBER(3)
17	SIBASE	Site index base age	NUMBER(3)
18	SUBP	Subplot number	NUMBER(3)
19	AZIMUTH	Azimuth	NUMBER(3)
20	DIST	Horizontal distance	NUMBER(4,1)
21	METHOD	Site tree method code	NUMBER(2)
22	SITREE_EST	Estimated site index for the tree	NUMBER(3)
23	VALIDCD	Validity code	NUMBER(1)
24	CONDLIST	Condition class list	NUMBER(4)
25	CREATED_BY	Created by	VARCHAR2(30)
26	CREATED_DATE	Created date	DATE
27	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
28	MODIFIED_BY	Modified by	VARCHAR2(30)
29	MODIFIED_DATE	Modified date	DATE
30	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
31	CYCLE	Inventory cycle number	NUMBER(2)
32	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	SIT_PK
Unique	PLT_CN, CONDID, TREE	N/A	SIT_UK
Natural	STATECD, INVYR, UNITCD, COUNTYCD, PLOT, CONDID, TREE	N/A	SIT_NAT_I

Type of key	Column(s) order	Tables to link	Abbreviated notation
Foreign	PLT_CN, CONDID	SITETREE to COND	SIT_CND_FK
Foreign	PLT_CN	SITETREE to PLOT	SIT_PLT_FK

Note: The SITETREE record may not exist for some periodic inventory data.

1. CN — Sequence number. A unique sequence number used to identify a site tree record.
2. PLT_CN — Plot sequence number. Foreign key linking the site tree record to the plot record.
3. PREV_SIT_CN — Previous site tree sequence number. Foreign key linking the site tree to the previous inventory's site tree record for this tree. Only populated for site trees from previous annual inventories.
4. INVYR — Inventory year. See SURVEY.INVYR description for definition.
5. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B.
6. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, survey units may be made up of lands of particular owners. Refer to appendix B for codes.
7. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix B for codes.
8. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.
9. CONDID — Condition class number. The unique identifying number assigned to a condition for which the sitetree is measured, and to which the site index is applied. See COND.CONDID for details on the attributes which delineate a condition.
10. TREE — Tree number. A number used to uniquely identify a site tree on a condition.
11. SPCD — Species code. A standard tree species code. Refer to appendix F for codes.
12. DIA — Diameter. The current diameter (in inches) of the tree at the point of diameter measurement (DBH/DRC).

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

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

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

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

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

18. SUBP — Subplot number. (*Core optional*) The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

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

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

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

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

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

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

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

24. CONDLIST Condition class list. A list of numbers indicating all of the condition classes for which the site index data for this tree can be used. This attribute will be dropped in version 6.0.

25. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

26. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

27. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

28. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

29. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

30. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

31. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

32. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

Invasive Subplot Species Table (Oracle table name is INVASIVE_SUBPLOT_SPP)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	UNITCD	Survey unit code	NUMBER(2)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER
8	SUBP	Subplot number	NUMBER
9	CONDID	Condition class number	NUMBER(1)
10	VEG_FLDSPCD	Vegetation field species code	VARCHAR2(10)
11	UNIQUE_SP_NBR	Unique species number	NUMBER(2)
12	VEG_SPCD	Vegetation species code	VARCHAR2(10)
13	COVER_PCT	Cover percent	NUMBER(3)
14	CREATED_BY	Created by	VARCHAR2(30)
15	CREATED_DATE	Created date	DATE
16	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
17	MODIFIED_BY	Modified by	VARCHAR2(30)
18	MODIFIED_DATE	Modified date	DATE
19	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
20	CYCLE	Inventory cycle number	NUMBER(2)
21	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	ISS_PK
Unique	PLT_CN, VEG_FLDSPCD, UNIQUE_SP_NBR, SUBP, CONDID	N/A	ISS_UK
Foreign	PLT_CN	INVASIVE_SUBPLOT_SPP to PLOT	ISS_PLT_FK
Foreign	PLT_CN, SUBP, CONDID	INVASIVE_SUBPLOT_SPP to SUBP_COND	ISS_SCD_FK

1. CN — Sequence number. A unique sequence number used to identify an invasive subplot species record.

2. PLT_CN — Plot sequence number. Foreign key linking the invasive subplot species record to the plot record for this location.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

5. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

7. PLOT Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

8. SUBP Subplot number. The number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

9. CONDID Condition class number. The unique identifying number assigned to a condition on which the invasive species is located. See COND.CONDID for details on the attributes which delineate a condition.

10. VEG_FLDSPCD

    Vegetation field species code. Species code assigned by the field crew, conforming to the NRCS PLANTS database as downloaded in January 2010.

11. UNIQUE_SP_NBR

    Unique species number. Identifies a unique species on the plot.

12. VEG_SPCD Vegetation species code. Species code conforming to the NRCS PLANTS database as downloaded in January 2010.

13. COVER_PCT Cover percent. 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.

14. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

15. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

16. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

17. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

18. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

19. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

20. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

21. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

P2Vegetation Subplot Species Table (Oracle table name is P2VEG_SUBPLOT_SPP)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	UNITCD	Survey unit code	NUMBER(2)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER
8	SUBP	Subplot number	NUMBER
9	CONDID	Condition class number	NUMBER(1)
10	VEG_FLDSPCD	Vegetation field species code	VARCHAR2(10)
11	UNIQUE_SP_NBR	Unique species number	NUMBER(2)
12	VEG_SPCD	Vegetation species code	VARCHAR2(10)
13	GROWTH_HABIT_CD	Growth habit code	VARCHAR2(2)
14	LAYER	Layer	NUMBER(1)
15	COVER_PCT	Cover percent	NUMBER(3)
16	CREATED_BY	Created by	VARCHAR2(30)
17	CREATED_DATE	Created date	DATE
18	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
19	MODIFIED_BY	Modified by	VARCHAR2(30)
20	MODIFIED_DATE	Modified date	DATE
21	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
22	CYCLE	Inventory cycle number	NUMBER(2)
23	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	P2VSSP_PK
Unique	PLT_CN, VEG_FLDSPCD, UNIQUE_SP_NBR, SUBP, CONDID	N/A	P2VSSP_UK
Foreign	PLT_CN	P2VEG_SUBPLOT_SPP to PLOT	P2VSSP_PLT_FK
Foreign	PLT_CN, SUBP, CONDID	P2VEG_SUBPLOT_SPP to SUBP_COND	P2VSSP_SCD_FK

1. CN — Sequence number. A unique sequence number used to identify a P2 vegetation subplot species record.

2. PLT_CN — Plot sequence number. Foreign key linking the P2 vegetation subplot species record to the plot record for this location.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

5. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

7. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

8. SUBP — Subplot number. The number assigned to the subplot where P2 vegetation data were collected.

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

9. CONDID — Condition class number. The unique identifying number assigned to a condition on which the vegetation species is located. See COND.CONDID for details on the attributes which delineate a condition.

10. VEG_FLDSPCD

    Vegetation field species code. Species code assigned by the field crew, conforming to the NRCS PLANTS database as downloaded in January 2010.

11. UNIQUE_SP_NBR

    Unique species number. A unique number indicating each unidentified species encountered on the plot. Identifies the number of species occurrences within each NRCS genus or unknown code. For example, 2 unidentifiable CAREX species would be entered as 2 separate records with differing Unique Species Numbers to show that they are not the same species.

12. VEG_SPCD — Vegetation species code. A code indicating each sampled vascular plant species found rooted in or overhanging the sampled condition of the subplot at any height. Species codes are the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database (currently January 2010 version).

13. GROWTH_HABIT_CD

Growth habit code (species growth habit). A code indicating the growth habit of the species. Tally tree species are always recorded as trees, even when they exhibited a shrub-like growth habit. If a species had more than one growth habit on a condition in a subplot, the most prevalent one was recorded; however, both tree habits (SD and LT) could be coded for the same species if PLOT.LEVEL OF DETAIL=3 and the species was found in both size classes. A species may be recorded with a different growth habit on a different subplot-condition on the same plot. In the code definitions, LEVEL OF DETAIL = LOD. P2VEG_SUBPLOT_SPP.GROWTH_HABIT_CD is not to be confused with P2VEG_SUBP_STRUCTURE.GROWTH_HABIT_CD. The codes are similar, but not exactly the same.

Code	Description
SD	Seedlings and Saplings: Small trees less than 5 inches DBH or DRC (refer to field guide sections 5.9.2 and 5.9.4), including tally and non-tally tree species. Seedlings of any length are included (i.e., no minimum.) Up to four species are recorded if individual species total aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.
SH	Shrubs/Subshrubs/Woody Vines: Woody, multiple-stemmed plants of any size, subshrubs (low-growing shrubs under 1.5 feet tall at maturity), and woody vines. Most cacti are included in this category. Subshrub species are usually included in this category. However, there are many species that can exhibit either subshrub or forb/herb growth habits. Each FIA region will develop a list of common species that can exhibit either growth habits (according to the NRCS PLANTS database) with regional guidance as to which growth habit the species should normally be assigned, while still allowing species assignments to different growth habits when the species is obviously present in a different growth habit. Up to four species are recorded if individual species total aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.
FB	Forbs: Herbaceous, broad-leaved plants; includes non-woody-vines, ferns (does not include mosses and cryptobiotic crusts.) Up to four species are recorded if individual species total aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.
GR	Graminoids: Grasses and grass-like plants (includes rushes and sedges). Up to four species are recorded if individual species total aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 2 or LOD =3.
LT	Large Trees: Large trees greater than or equal to 5 inches DBH or DRC (refer to field guide sections 5.9.2 and 5.9.4), including tally and non-tally tree species. Up to four species of large trees (DBH or DRC at least 5 inches) are recorded if individual species aerial canopy cover is at least 3% on the subplot and within the GROWTH_HABIT_CD when LOD = 3.

14. LAYER

Layer (species vegetation layer). A code indicating the vertical layer in which the plant species was found.

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

15. COVER_PCT

Cover percent (species canopy cover). For each species recorded, the canopy cover present on the subplot condition to the nearest 1 percent. Note that cover is always recorded as a percent of the full subplot area, even if the condition that was assessed did not cover the full subplot.

16. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

17. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

18. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

19. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

20. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

21. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

22. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

23. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

P2Vegetation Subplot Structure Table (Oracle table name is P2VEG_SUBP_STRUCTURE)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	STATECD	State code	NUMBER(4)
4	UNITCD	Survey unit code	NUMBER(2)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER
7	INVYR	Inventory year	NUMBER(4)
8	SUBP	Subplot number	NUMBER
9	CONDID	Condition class number	NUMBER(1)
10	GROWTH_HABIT_CD	Growth habit code	VARCHAR2(2)
11	LAYER	Layer	NUMBER(1)
12	COVER_PCT	Cover percent	NUMBER(3)
13	CREATED_BY	Created by	VARCHAR2(30)
14	CREATED_DATE	Created date	DATE
15	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
16	MODIFIED_BY	Modified by	VARCHAR2(30)
17	MODIFIED_DATE	Modified date	DATE
18	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
19	CYCLE	Inventory cycle number	NUMBER(2)
20	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	P2VSS_PK
Unique	PLT_CN, SUBP, CONDID, GROWTH_HABIT_CD, LAYER	N/A	P2VSS_UK
Unique	STATECD, COUNTYCD, PLOT, INVYR, SUBP, CONDID, GROWTH_HABIT_CD, LAYER	N/A	P2VSS_UK2
Unique	STATECD, CYCLE, SUBCYCLE, COUNTYCD, PLOT, SUBP, CONDID, GROWTH_HABIT_CD, LAYER	N/A	P2VSS_UK3
Foreign	PLT_CN	P2VEG_SUBP_STRUCTURE to PLOT	P2VSS_PLT_FK
Foreign	PLT_CN, SUBP, CONDID	P2VEG_SUBP_STRUCTURE to SUBP_COND	P2VSS_SCD_FK

1. CN — Sequence number. A unique sequence number used to identify a P2Vegetation Subplot Structure record.

2. PLT_CN — Plot sequence number. Foreign key linking the P2Vegetation Subplot Structure record to the plot record for this location.

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

4. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

6. PLOT Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combinations of variables, PLOT may be used to uniquely identify a plot.

7. INVYR Inventory year. See SURVEY.INVYR description for definition.

8. SUBP Subplot number. The number assigned to the subplot where P2 vegetation data were collected.

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

9. CONDID Condition class number. The unique identifying number assigned to a condition that exists on the subplot, and is defined in the COND table. See COND.CONDID for details on the attributes which delineate a condition.

10. GROWTH_HABIT_CD

Growth habit code (vegetation structure growth habit). Vegetation structure growth habit based on species and appearance of plants on the subplot condition. If a tree species has been selected as a tally tree species by the particular FIA unit, that species is recorded as a tally tree species growth habit (TT), even if it grows as a shrub in some environments. Woody plants not on the unit's tally tree species list may have a tree growth habit in some environments, and these are recorded as non-tally tree species (NT). If the growth habit is shrub in another environment, that species is recorded as a shrub (SH). In the code definitions, level of detail = LOD.

Code	Description
TT	Tally Tree Species: All core tree species and any core optional tree species selected by a particular FIA unit. Any plant of that species is included, regardless of its shape and regardless of whether it was tallied on the subplot or microplot during tree tally. Seedlings (any length, no minimum), saplings, and mature plants are included.
NT	Non-tally Tree Species: Tree species not on a particular FIA unit's tree tally list that are woody plants with a single well-defined, dominant main stem, not supported by other vegetation or structures (not

Code	Description
	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: 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: Herbaceous, broad-leaved plants; includes non-woody-vines, ferns (does not include mosses and cryptobiotic crusts). Up to four species are recorded if individual species total cover is at least 3% of the subplot area when LOD = 2 or LOD =3.
GR	Graminoids: Grasses and grass-like plants (includes rushes and sedges). Up to four species are recorded if individual species total cover is at least 3% of the subplot area when LOD = 2 or LOD =3.

11. LAYER

    Layer (species vegetation layer). A code indicating the vertical layer in which the plant species was found.

Code	Description
1	0 to 2.0 feet
2	2.1 to 6.0 feet
3	6.1 to 16.0 feet
4	Greater than 16 feet
5	Aerial: Canopy cover for all layers

12. COVER_PCT

    Cover percent (species percent canopy cover). For each species recorded, the canopy cover present on the subplot condition to the nearest 1 percent. Note that cover is always recorded as a percent of the full subplot area, even if the condition that was assessed did not cover the full subplot.

13. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

14. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

15. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

16. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

17. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

18. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

19. CYCLE — Inventory cycle number. See SURVEY.CYCLE description for definition.

20. SUBCYCLE — Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

Down Woody Material Visit Table (Oracle table name is DWM_VISIT)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	MEASDAY	Measurement day	NUMBER(2)
8	MEASMON	Measurement month	NUMBER(2)
9	MEASYEAR	Measurement year	NUMBER(4)
10	QASTATCD	Quality assurance status code	NUMBER(1)
11	CRWTYPCD	Crew type code	NUMBER(1)
12	SMPKNDCD	Sample kind code	NUMBER(2)
13	CREATED_BY	Created by	VARCHAR2(30)
14	CREATED_DATE	Created date	DATE
15	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
16	MODIFIED_BY	Modified by	VARCHAR2(30)
17	MODIFIED_DATE	Modified date	DATE
18	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	DVT_PK
Unique	PLT_CN	N/A	DVT_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT	N/A	DVT_NAT_I
Foreign	PLT_CN	DWM_VISIT to PLOT	DVT_PLT_FK

1. CN — Sequence number. A unique sequence number used to identify a down woody material visit record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material visit record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT P2 plot number. An identifier for a plot. Along with STATECD, INVYR, and COUNTYCD, PLOT may be used to uniquely identify a plot.

7. MEASDAY Measurement day. The day on which the plot was completed.

8. MEASMON Measurement month. The month in which the plot was completed.

Code	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

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

10. QASTATCD Quality assurance status code. A code indicating the type of plot data collected. Production plots have QASTATCD = 1 or 7.

Code	Quality assurance status
1	Standard production plot
2	Cold check
3	Reference plot (off grid)
4	Training/practice plot (off grid)
5	Botched plot file (disregard during data processing)
6	Blind check
7	Production plot (hot check)

11. CRWTYPCD Crew type code. A code identifying the type of crew measuring the plot.

Code	Crew type
1	Standard field crew
2	QA crew (any QA crew member present collecting data)

12. SMPKNDCD Sample kind code. A code indicating the type of plot installation.

Code	Sample kind code
0	Periodic inventory plot
1	Initial installation of a national design plot
2	Remeasurement of previously installed national design plot
3	Replacement of previously installed national design plot
4	Modeled periodic inventory plot (Northeast and North Central only)

13. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

14. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

15. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

16. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

17. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

18. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Down Woody Material Coarse Woody Debris Table (Oracle table name is DWM_COARSE_WOODY_DEBRIS)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	SUBP	Subplot number	NUMBER(1)
8	TRANSECT	Transect	NUMBER(3)
9	CWDID	Coarse woody debris piece (log) number	NUMBER
10	MEASYEAR	Measurement year	NUMBER(4)
11	CONDID	Condition class number	NUMBER(1)
12	SLOPDIST	Slope distance	NUMBER
13	HORIZ_DIST	Horizontal distance	NUMBER
14	SPCD	Species code	NUMBER
15	DECAYCD	Decay class code	NUMBER(1)
16	TRANSDIA	Transect diameter	NUMBER(3)
17	SMALLDIA	Small diameter	NUMBER(3)
18	LARGEDIA	Large diameter	NUMBER(3)
19	LENGTH	Length of the piece	NUMBER(3)
20	HOLLOWCD	Hollow code	VARCHAR2(1)
21	CWDHSTCD	Coarse woody debris history code	NUMBER(1)
22	VOLCF	Cubic foot volume of the piece	NUMBER
23	DRYBIO	Dry biomass of the piece	NUMBER
24	CARBON	Carbon mass of the piece	NUMBER
25	COVER_PCT	Percent cover represented by each coarse woody debris piece, core design	NUMBER
26	LPA_UNADJ	Number of logs (pieces) per acre, unadjusted, national core design	NUMBER
27	LPA_PLOT	Number of logs (pieces) per acre on the plot, unadjusted, national core design	NUMBER
28	LPA_COND	Number of logs (pieces) per acre in the condition, national core design	NUMBER
29	LPA_UNADJ_RGN	Number of logs (pieces) per acre, unadjusted, regional design	NUMBER
30	LPA_PLOT_RGN	Number of logs (pieces) per acre on the plot, regional design	NUMBER
31	LPA_COND_RGN	Number of logs (pieces) per acre in the condition, regional design	NUMBER
32	COVER_PCT_RGN	Percent cover, represented by each coarse woody debris piece, regional design	NUMBER(3)

	Column Name	Descriptive Name	Oracle data type
33	CHRCD_PNWRS	Charred by fire code, Pacific Northwest Research Station	NUMBER(1)
34	ORNTCD_PNWRS	Orientation code, Pacific Northwest Research Station	VARCHAR2(1)
35	CREATED_BY	Created by	VARCHAR2(30)
36	CREATED_DATE	Created date	DATE
37	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
38	MODIFIED_BY	Modified by	VARCHAR2(30)
39	MODIFIED_DATE	Modified date	DATE
40	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	DCW_PK
Unique	PLT_CN, TRANSECT, SUBP, CWDID	N/A	DCW_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, TRANSECT, SUBP, CWDID	N/A	DCW_NAT_I

1. CN — Sequence number. A unique sequence number used to identify a down woody material coarse woody debris record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material coarse woody debris record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

7. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

8. TRANSECT — Transect. A code indicating the transect on which coarse woody debris was measured. Each code represents the azimuth of the transect line, extending out from subplot center.

Code	Transect
030	Transect extends 30 degrees from subplot center.
150	Transect extends 150 degrees from subplot center.
270	Transect extends 270 degrees from subplot center.

9. CWDID — Coarse woody debris piece (log) number. A number that uniquely identifies each piece that was tallied along one transect.

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

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

12. SLOPDIST — Slope distance. The slope distance, in feet, between the subplot center and the point where the transect intersects the longitudinal center of the coarse woody debris (CWD) piece.

13. HORIZ_DIST — Horizontal distance. The horizontal distance, in feet, between subplot center and the point where the transect intersects the longitudinal center of the CWD piece.

14. SPCD — Species code. An FIA tree species code. Refer to appendix F for codes. If the CWD piece is the woody stem of a shrub, a code of 001 is recorded.

15. DECAYCD — Decay class code. A code indicating the stage of decay that predominates along the recorded total length of the CWD piece. DECAYCD is used to reduce biomass based on ratios stored in the REF_SPECIES table. **Note**: Pieces within decay class 5 must still resemble a log; the pieces must be ≥ 5.0 inches in diameter, ≥5.0 inches from the surface of the ground, and at least 3.0 feet long.

Decay Class	Structural Integrity	Texture of Rotten Portions	Color of Wood	Invading Roots	Branches and Twigs
1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish-brown or original color	Sapwood only	Branch stubs will not pull out
4	Heartwood rotten; piece does not support its own weight, but maintains its shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Throughout	Branch stubs pull out
5	None, piece no longer maintains its shape, it spreads out on ground	Soft; powdery when dry	Red-brown to dark brown	Throughout	Branch stubs and pitch pockets have usually rotted down

16. TRANSDIA Transect diameter. The diameter, in inches, at the point where the longitudinal center of the piece intersects the transect.

17. SMALLDIA Small diameter. The diameter, in inches, at the small end of the piece, or at the point where the piece tapers down to 3 inches. If the small end is splintered or decomposing, the diameter is measured at a point that best represents the overall volume of the piece.

18. LARGEDIA Large diameter. The diameter, in inches, at the large end of the piece, or at the point just above the root collar. If the end is splintered or decomposing, the diameter is measured at a point that best represents the overall volume of the piece.

19. LENGTH Length of the piece. Length, in feet, of the CWD piece, measured between the small- and large-end diameters, or if the piece is decay class 5, between the physical ends of the piece.

20. HOLLOWCD Hollow code. A code indicating whether or not the piece is hollow. If the piece has a cavity that extends at least 2 feet along the central longitudinal axis and the diameter of the cavity entrance is at least ¼ of the diameter at the end of the piece, it is classified as hollow.

Code	Hollow
Y	The piece is hollow.
N	The piece is not hollow.

21. CWDHSTCD Coarse woody debris history code. A code indicating whether or not the piece of CWD is on the ground as a result of harvesting operations or as a result of natural circumstances.

Code	Coarse woody debris history
1	CWD piece is on the ground as a result of natural causes.
2	CWD piece is on the ground as a result of major recent harvest activity (≤ 15 yrs old).
3	CWD piece is on the ground as a result of older harvest activity (>15 yrs old).
4	CWD piece is on the ground as a result of an incidental harvest (such as firewood cutting).
5	Exact Reason Unknown.

22. VOLCF Cubic-foot volume of the piece. The volume (in cubic feet) estimated for the CWD piece, based on length and either the small- and large-end diameter or just the transect diameter. This is a per piece value and must be multiplied by one of the logs per acre (LPA) to obtain per acre information.

23. DRYBIO Dry biomass of the piece. The oven-dry biomass (in pounds) estimated for the CWD piece, adjusted for the degree of decomposition based on DECAYCD. Piece weight is reduced as it decomposes. This is a per piece value and must be multiplied by one of the logs per acre (LPA) to obtain per acre information.

24. CARBON Carbon mass of the piece. The oven-dry weight of carbon (in pounds) estimated for the CWD piece, adjusted for the degree of decomposition based on DECAYCD. Carbon mass of the piece is reduced as it decomposes. This is a per piece value and must be multiplied by one of the logs per acre (LPA) to obtain per acre information.

25. COVER_PCT Percent cover represented by each coarse woody debris piece, core design. An estimate of the percent of the condition area covered by the CWD piece.

26. LPA_UNADJ Number of logs (pieces) per acre, unadjusted, national core design. This estimate is the number of logs per acre the individual piece represents, when sampled using the national core design. The estimate is based on the target transect length (COND_DWM_CALC.CWD_TL_UNADJ), which is the total length of transect that could potentially be installed on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used to calculate population estimates and not to derive estimates for one condition or individual plot. It should be summed for a condition or plot, adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table, and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for number of CWD logs in an area of interest (e.g., state). This column will be populated for all phase 3 plots. Where phase 2 and phase 3 designs are overlaid, all CWD pieces with HORIZ_DIST greater than 24 feet will have null in this field. It is important to select the appropriate EVALID and use the LPA column associated with that evaluation (see LPA_UNADJ_RGN).

27. LPA_PLOT Number of logs (pieces) per acre on the plot, national core design. This estimate is the number of logs per acre the individual piece represents on the plot when

sampled using the national core design. The estimate is based on the actual length of transect installed and sampled on the plot. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual plot locations, and is not adjusted or used to develop population estimates. This column will be populated for all phase 3 plots. Where phase 2 and phase 3 designs are overlaid, all CWD pieces with HORIZ_DIST greater than 24 feet will have null in this field. It is important to select the appropriate EVALID and use the LPA column associated with that evaluation (see LPA_PLOT_RGN).

28. LPA_COND Number of logs (pieces) per acre in the condition, national core design. This estimate is the number of logs per acre the individual piece represents on one condition on the plot when sampled using the national core design. The estimate is based on the actual length of transect installed and sampled on that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot, and is not adjusted or used to develop population estimates. This column will be populated for all phase 3 plots. Where phase 2 and phase 3 designs are overlaid, all CWD pieces with HORIZ_DIST greater than 24 feet will have null in this field. It is important to select the appropriate EVALID and use the LPA column associated with that evaluation (see LPA_COND_RGN).

29. LPA_UNADJ_RGN

Number of logs (pieces) per acre, unadjusted, regional design. This estimate is the number of logs per acre the individual piece represents when sampled using a regional design that differs from the national core design. The estimate is based on the target transect length (COND_DWM_CALC.CWD_TL_UNADJ), which is the total length of transect that could potentially be installed on the plot of the regional design, before adjustment for partially nonsampled plots in the stratum. This attribute is used to calculate population estimates and not to derive estimates for one condition or individual plot. It should be summed for a condition or plot, adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table, and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for number of CWD logs in an area of interest (e.g., state). This column will be populated for all plots sampled with a regional design, where transect length and configuration differ from the core design. When regional and core designs are overlaid, those CWD pieces that fall only on the core design will have null in this field (e.g., this column contains data for RSCD = 26, where a regional design was used to sample all phase 2 plots in the inventory). Contact FIA work units for information on regional sampling protocol. It is important to select the appropriate EVALID and use the LPA column associated with that evaluation (see LPA_UNADJ).

30. LPA_PLOT_RGN

Number of logs (pieces) per acre on the plot, regional design. This estimate is the number of logs per acre the individual piece represents on the plot when

sampled using a regional design that differs from the national core design. The estimate is based on the actual length of transect installed and sampled on the plot. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual plot locations, and is not adjusted or used to develop population estimates. This column will be populated for all plots sampled with a regional design, where transect length and configuration differ from the core design. When regional and core designs are overlaid, those CWD pieces that fall only on the core design will have null in this field (e.g., this column contains data for RSCD = 26, where a regional design was used to sample all phase 2 plots in the inventory). Contact FIA work units for information on regional sampling protocol. It is important to select the appropriate EVALID and use the LPA column associated with that evaluation (see LPA_PLOT).

31. LPA_COND_RGN

Number of logs (pieces) per acre in the condition, regional design. This estimate is the number of logs per acre the individual piece represents on one condition on the plot when sampled using a regional design that differs from the national core design. The estimate is based on the actual length of transect installed and sampled on that condition. This attribute is useful for analysis projects that involve modeling, mapping, or classifying individual conditions within a plot, and is not adjusted or used to develop population estimates. This column will be populated for all plots sampled with a regional design, where transect length and configuration differ from the core design. When regional and core designs are overlaid, those CWD pieces that fall only on the core design will have null in this field (e.g., this column contains data for RSCD = 26, where a regional design was used to sample all phase 2 plots in the inventory). Contact FIA work units for information on regional sampling protocol. It is important to select the appropriate EVALID and use the LPA column associated with that evaluation (see LPA_COND).

32. COVER_PCT_RGN

Percent cover, represented by each coarse woody debris piece, regional design. An estimate of the percent of the condition area covered by the CWD piece, within the regional design.

33. CHRCD_PNWRS

Charred by fire code, Pacific Northwest Research Station. A code indicating the percentage of the piece's surface that has been charred by fire.

Code	Description
0	None of the piece is charred by fire.
1	Up to 1/3 of the piece is charred by fire.
2	1/3 to 2/3 of the piece is charred by fire.
3	2/3 or more of the piece is charred by fire.

34. ORNTCD_PNWRS

    Orientation code, Pacific Northwest Research Station. Orientation on slope.

35. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

36. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

37. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_ INSTANCE description for definition.

38. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

39. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

40. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_ INSTANCE description for definition.

Down Woody Material Duff, Litter, Fuel Table (Oracle table name is DWM_DUFF_LITTER_FUEL)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	TRANSECT	Transect	NUMBER(3)
8	SUBP	Subplot number	NUMBER(1)
9	SMPLOCCD	Sample location code	NUMBER(1)
10	MEASYEAR	Measurement year	NUMBER(4)
11	SMPLDCD	Sampled code	NUMBER(1)
12	CONDID	Condition class number	NUMBER(1)
13	DUFFDEP	Duff depth	NUMBER
14	LITTDEP	Litter depth	NUMBER
15	FUELDEP	Fuelbed depth	NUMBER
16	CREATED_BY	Created by	VARCHAR2(30)
17	CREATED_DATE	Created date	DATE
18	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
19	MODIFIED_BY	Modified by	VARCHAR2(30)
20	MODIFIED_DATE	Modified date	DATE
21	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	DDL_PK
Unique	PLT_CN, TRANSECT, SUBP, SMPLOCCD	N/A	DDL_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, TRANSECT, SUBP, SMPLOCCD	N/A	DDL_NAT_I

1. CN — Sequence number. A unique sequence number used to identify a down woody material duff, litter, fuel record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material duff, litter, fuel record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

7. TRANSECT Transect. A code indicating the azimuth of the subplot transect.

Code	Transect
030	Transect extends 30 degrees from subplot center.
150	Transect extends 150 degrees from subplot center.
270	Transect extends 270 degrees from subplot center.

8. SUBP Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

9. SMPLOCCD Sample location code. A code indicating the location along the transect where duff, litter, and fuelbed samples were taken. One transect is sampled on each subplot. Prior to 2002, there were two sample locations on the transect (at 14 and 24 feet, slope distance). Starting in 2002, there is only one sample location on the transect (at 24 feet, slope distance).

Code	Sample location
1	Duff, litter, and fuelbed sampled at 14 feet, slope distance.
2	Duff, litter, and fuelbed sampled at 24 feet, slope distance.

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

11. SMPLDCD Sampled code. A code indicating whether or not the depths of the duff, litter, and fuelbed were measured. If a log obstructed the sample location, fuelbed depth was measured but duff and litter depths were not measured. For all other obstructions (e.g., rocks), no depths were measured.

Code	Sampled
0	Partially sampled : fuelbed sampled; duff and litter depth not sampled.
1	All sampled: duff, litter, and fuelbed sampled.
2	Nothing sampled: duff, litter, fuelbed not sampled.

12. CONDID Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status,

and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of the plot establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

13. DUFFDEP Duff depth. Depth of duff layer to the nearest 0.1 inch. The measurement is taken at an exact point on the 150 azimuth transect (see SMPLOCCD for location). Duff is the layer just below litter. It consists of decomposing leaves and other organic material. There are no recognizable plant parts; the duff layer is usually dark decomposed organic matter. When moss is present, the top of the duff layer is just below the green portion of the moss. The bottom of this layer is the point where mineral soil begins. To use these data, calculate an average depth for the condition.

14. LITTDEP Litter depth. Depth of litter layer to the nearest 0.1 inch. The measurement is taken at an exact point on the 150 azimuth transect (see SMPLOCCD for location). Litter is the layer of freshly fallen leaves, needles, twigs (< 0.25 inch in diameter), cones, detached bark chunks, dead moss, dead lichens, detached small chunks of rotted wood, dead herbaceous stems, and flower parts (detached and not upright). Litter is the loose plant material found on the top surface of the forest floor. Little decomposition has begun in this layer. To use these data, calculate an average depth for the condition.

15. FUELDEP Fuelbed depth. Depth of the fuelbed to the nearest 0.1 foot. The measurement is taken at an exact point on the 150 azimuth transect (see SMPLOCCD for location). The fuelbed is the accumulated mass of dead, woody material on the surface of the forest floor. It begins at the top of the duff layer, and includes litter, FWD, CWD, and dead woody shrubs. In this definition, the fuelbed does not include dead hanging branches from standing trees. To use these data, calculate an average depth for the condition.

16. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

17. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

18. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_ INSTANCE description for definition.

19. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

20. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

21. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_ INSTANCE description for definition.

Down Woody Material Fine Woody Debris Table (Oracle table name is DWM_FINE_WOODY_DEBRIS)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	TRANSECT	Transect	NUMBER(3)
8	SUBP	Subplot number	NUMBER(1)
9	CONDID	Condition class number	NUMBER(1)
10	MEASYEAR	Measurement year	NUMBER(4)
11	SMALLCT	Small-size class count	NUMBER(3)
12	MEDIUMCT	Medium-size class count	NUMBER(3)
13	LARGECT	Large-size class count	NUMBER(3)
14	RSNCTCD	Reason count code	NUMBER(1)
15	PILESCD	Piles code	NUMBER(1)
16	SMALL_TL_COND	Small-size class transect length in condition	NUMBER
17	SMALL_TL_PLOT	Small-size class transect length on plot	NUMBER
18	SMALL_TL_UNADJ	Small-size class transect length on plot, unadjusted	NUMBER
19	MEDIUM_TL_COND	Medium-size class transect length in condition	NUMBER
20	MEDIUM_TL_PLOT	Medium-size class transect length on plot	NUMBER
21	MEDIUM_TL_UNADJ	Medium-size class transect length on plot, unadjusted	NUMBER
22	LARGE_TL_COND	Large-size class transect length in condition	NUMBER
23	LARGE_TL_PLOT	Large-size class transect length on plot	NUMBER
24	LARGE_TL_UNADJ	Large-size class transect length on plot, unadjusted	NUMBER
25	CREATED_BY	Created by	VARCHAR2(30)
26	CREATED_DATE	Created date	DATE
27	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
28	MODIFIED_BY	Modified by	VARCHAR2(30)
29	MODIFIED_DATE	Modified date	DATE
30	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	DFW_PK
Unique	PLT_CN, TRANSECT, SUBP, CONDID	N/A	DFW_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, TRANSECT, SUBP, CONDID	N/A	DFW_NAT_I

1. CN — Sequence number. A unique sequence number used to identify a down woody material fine woody debris record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material fine woody debris record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and /or some other combination of attributes, PLOT may be used to uniquely identify a plot.

7. TRANSECT — Transect. A code indicating the azimuth of the subplot transect on which the piece is sampled.

Code	Transect
030	Transect extends 30 degrees from subplot center.
150	Transect extends 150 degrees from subplot center.
270	Transect extends 270 degrees from subplot center.

8. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

9. CONDID — Condition class number. Unique identifying number assigned to each condition on a plot. A condition is initially defined by condition class status. Differences in reserved status, owner group, forest type, stand-size class, regeneration status, and stand density further define condition for forest land. Mapped nonforest conditions are also assigned numbers. At the time of plot

establishment, the condition class at plot center (the center of subplot 1) is usually designated as condition class 1. Other condition classes are assigned numbers sequentially at the time each condition class is delineated. On a plot, each sampled condition class must have a unique number that can change at remeasurement to reflect new conditions on the plot.

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

11. SMALLCT Small-size class count. The number of pieces of 1-hr fuels counted in the small-size class (0.01- to 0.24-inch diameter) in one condition along the transect segment on the plot specified in the sample design to measure small-size class FWD. Individual pieces are tallied up to 50, then ocularly estimated over a tally of 50.

12. MEDIUMCT Medium-size class count. The number of pieces of 10-hr fuels counted in the medium-size class (0.25- to 0.9-inch diameter) in one condition along the transect segment on the plot specified in the sample design to measure medium-size class FWD. Individual pieces are tallied up to 50, then ocularly estimated over a tally of 50.

13. LARGECT Large-size class count. The number of pieces of 100-hr fuels counted in the large-size class (1.0 to 2.9 inch diameter) in one condition along the transect segment on the plot specified in the sample design to measure large-size class FWD. Individual pieces are tallied up to 20, then ocularly estimated over a tally of 20.

14. RSNCTCD Reason count code. A code indicating the reason that SMALLCT, MEDIUMCT, or LARGECT has more than 100 pieces tallied.

Code	Reason count
0	FWD is not unusually high (< 100).
1	High count is due to an overall high density of FWD across the transect.
2	Wood rat's nest located on transect.
3	Tree or shrub laying across transect.
4	Other reason.

15. PILESCD Piles code. A code indicating whether a residue pile intersects the FWD transect segment. If the code is 1 (Yes), then FWD is not sampled.

Code	Piles
0	No pile is present on the transect, FWD was sampled.
1	Yes, a pile is present on the transect, FWD was not sampled.

16. SMALL_TL_COND

Small-size class transect length in condition. Sum of the transect segment lengths that were installed to measure small-sized FWD in one condition on the plot.

17. SMALL_TL_PLOT

    Small-size class transect length on plot. Sum of the transect segment lengths that were installed to measure small-sized FWD on the plot. This total length includes all sampled conditions, excluding hazardous or access denied conditions.

18. SMALL_TL_UNADJ

    Small-size class transect length on plot, unadjusted. Sum of all transect segment lengths on the plot that were specified in the sample design to measure small-sized FWD. Includes transects in all conditions, sampled and nonsampled. This value must be adjusted using POP_STRATUM.ADJ_FACTOR_FWD_SM to derive population estimates.

19. MEDIUM_TL_COND

    Medium-size class transect length in condition. Sum of transect segment lengths that were installed to measure medium-sized FWD in one condition on the plot.

20. MEDIUM_TL_PLOT

    Medium-size class transect length on plot. Sum of transect segment lengths that were installed to measure medium-sized FWD on the plot. This total length includes segment in all sampled conditions, excluding hazardous or access denied conditions.

21. MEDIUM_TL_UNADJ

    Medium-size class transect length on plot, unadjusted. Sum of all transect segment lengths on the plot that were specified in the sample design to measure medium-sized FWD. Includes transects in all conditions, sampled and nonsampled. This value must be adjusted using POP_STRATUM.ADJ_FACTOR_FWD_SM to derive population estimates.

22. LARGE_TL_COND

    Large-size class transect length in condition. Sum of transect segment lengths that were installed to measure large-sized FWD in one condition on the plot.

23. LARGE_TL_PLOT

    Large-size class transect segment length on plot. Sum of transect segment lengths that were installed to measure large-sized FWD on the entire plot. This total length includes segments in all sampled conditions, excluding hazardous or access denied conditions.

24. LARGE_TL_UNADJ

    Large-size class transect length on plot, unadjusted. Sum of all transect segment lengths that were installed to measure large-sized FWD on the entire plot. Includes transects in all conditions, sampled and nonsampled. This value must be adjusted using POP_STRATUM.ADJ_FACTOR_FWD_LG to derive population estimates.

25. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

26. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

27. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_ INSTANCE description for definition.

28. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

29. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

30. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_ INSTANCE description for definition.

Down Woody Material Microplot Fuel Table (Oracle table name is DWM_MICROPLOT_FUEL)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	SUBP	Subplot number	NUMBER(1)
8	MEASYEAR	Measurement year	NUMBER(4)
9	LVSHRBCD	Live shrub code	NUMBER(2)
10	DSHRBCD	Dead shrub code	NUMBER(2)
11	LVHRBCD	Live herb code	NUMBER(2)
12	DHRBCD	Dead herb code	NUMBER(2)
13	LITTERCD	Litter code	NUMBER
14	LVSHRBHT	Live shrub height	NUMBER
15	DSHRBHT	Dead shrub height	NUMBER
16	LVHRBHT	Live herb height	NUMBER
17	DHRBHT	Dead herb height	NUMBER
18	CREATED_BY	Created by	VARCHAR2(30)
19	CREATED_DATE	Created date	DATE
20	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
21	MODIFIED_BY	Modified by	VARCHAR2(30)
22	MODIFIED_DATE	Modified date	DATE
23	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	DMF_PK
Unique	PLT_CN, SUBP	N/A	DMF_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP	N/A	DMF_NAT_I

1. CN — Sequence number. A unique sequence number used to identify a down woody material microplot fuel record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material microplot fuel record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

7. SUBP Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

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

9. LVSHRBCD Live shrub code. A cover class code indicating the percent cover of the forested microplot area covered with live shrubs.

Code	Live shrub
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
40	31-40%
50	41-50%
60	51-60%
70	61-70%
80	71-80%
90	81-90%
99	91-100%

10. DSHRBCD Dead shrub code. A cover class code indicating the percent cover of the forested microplot area covered with dead shrubs and dead branches attached to live shrubs if visible from above.

Code	Dead shrub
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
40	31-40%
50	41-50%
60	51-60%

Code	Dead shrub
70	61-70%
80	71-80%
90	81-90%
99	91-100%

11. LVHRBCD Live herb code. A cover class code indicating the percent cover of the forested microplot area covered with live herbaceous plants.

Code	Live herb
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
40	31-40%
50	41-50%
60	51-60%
70	61-70%
80	71-80%
90	81-90%
99	91-100%

12. DHRBCD Dead herb code. A cover class code indicating the percent cover of the forested microplot area covered with dead herbaceous plants and dead leaves attached to live plants if visible from above.

Code	Dead herb
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
40	31-40%
50	41-50%
60	51-60%
70	61-70%
80	71-80%
90	81-90%
99	91-100%

13. LITTERCD Litter code. A cover class code indicating the percent cover of the forested microplot area covered with litter. Litter is the layer of freshly fallen leaves, twigs, dead moss, dead lichens, and other fine particles of organic matter found on the surface of the forest floor. Decomposition is minimal.

Code	Litter
00	Absent
01	Trace (<1% cover)

Code	Litter
10	1-10%
20	11-20%
30	21-30%
40	31-40%
50	41-50%
60	51-60%
70	61-70%
80	71-80%
90	81-90%
99	91-100%

14. LVSHRBHT Live shrub height. Indicates the height of the tallest shrub to the nearest 0.1 foot. Heights < 6 feet are measured and heights ≥ 6 feet are estimated.

15. DSHRBHT Dead shrub height. Indicates the height of the tallest dead shrub to the nearest 0.1 foot. Heights < 6 feet are measured and heights ≥ 6 feet are estimated.

16. LVHRBHT Live herb height. Indicates the height (at the tallest point) of the live herbaceous layer to the nearest 0.1 foot. Maximum height is 6 feet.

17. DHRBHT Dead herb height. Indicates the height (at the tallest point) of the dead herbaceous layer to the nearest 0.1 foot. Maximum height is 6 feet.

18. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

19. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

20. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_ INSTANCE description for definition.

21. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

22. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

23. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_ INSTANCE description for definition.

Down Woody Material Residual Pile Table (Oracle table name is DWM_RESIDUAL_PILE)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	SUBP	Subplot number	NUMBER(1)
8	PILE	Pile number	NUMBER
9	MEASYEAR	Measurement year	NUMBER(4)
10	CONDID	Condition class number	NUMBER(1)
11	SHAPECD	Shape code	NUMBER(1)
12	AZIMUTH	Azimuth	NUMBER(3)
13	DENSITY	Density (packing ratio of pile)	NUMBER(2)
14	HEIGHT1	Height first measurement	NUMBER(2)
15	WIDTH1	Width first measurement	NUMBER(2)
16	LENGTH1	Length first measurement	NUMBER(2)
17	HEIGHT2	Height second measurement	NUMBER(2)
18	WIDTH2	Width second measurement	NUMBER(2)
19	LENGTH2	Length second measurement	NUMBER(2)
20	VOLCF	Gross cubic foot volume	NUMBER
21	DRYBIO	Dry biomass	NUMBER
22	CARBON	Carbon mass	NUMBER
23	PPA_UNADJ	Piles per acre, unadjusted, for population estimates	NUMBER
24	PPA_PLOT	Piles per acre, unadjusted for plot estimates	NUMBER
25	PPA_COND	Piles per acre, unadjusted, for condition estimates	NUMBER
26	CREATED_BY	Created by	VARCHAR2(30)
27	CREATED_DATE	Created date	DATE
28	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
29	MODIFIED_BY	Modified by	VARCHAR2(30)
30	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
31	MODIFIED_DATE	Modified date	DATE

Type of Key	Column(s)	Tables to link	Abbreviated notation
Primary	CN	N/A	DRP_PK
Unique	PLT_CN, SUBP, PILE	N/A	DRP_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP, PILE	N/A	DRP_NAT_I

1. CN — Sequence number. A unique sequence number used to identify a down woody material residual pile record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material residual pile record to the P2 plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR,UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

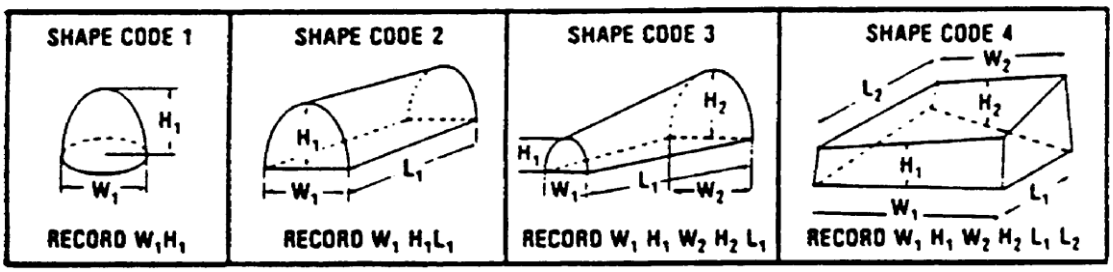
7. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

8. PILE — Pile number. A number that uniquely identifies each pile tallied on a subplot.

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

10. CONDID — Condition class number. Unique identifying number assigned to each condition on which the pile center is located. See COND. CONDID for details on the attributes that delineate a condition.

11. SHAPECD — Shape code. A code indicating the shape of the pile. The type of shape is used to select an equation to estimate pile cubic volume. See figure below.



PILE SHAPE codes (Hardy 1996). Figure 14-12 from the Forest Inventory and Analysis National Core Field Guide (Phase 3, version 3.0) (see http://www.fia.fs.fed.us/library/field-guides-methods-proc/)

Code	Shape
1	Paraboloids
2	Half-cylinder
3	Half-frustum of cone
4	Irregular solid

12. AZIMUTH — Azimuth. The code indicating the azimuth from the subplot center to the pile. This azimuth centers on the pile so that it can be relocated. Use 360 for north.

13. DENSITY — Density (packing ratio of pile). A code indicating the percent of the pile that consists of woody material ≥ 3 inches. Air, soil, rock, and live plants are not included in the estimate. Estimated to the nearest 10 percent.

Code	Density
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
40	31-40%
50	41-50%
60	51-60%
70	61-70%
80	71-80%
90	81-90%
99	91-100%

14. HEIGHT1 — Height first measurement. The estimated height (in feet) of either end of the pile. Pile height1 may equal pile height2. See figure under SHAPECD.

15. WIDTH1 — Width first measurement. The estimated width (in feet) of the side of HEIGHT1. Pile width1 may equal pile width2. See figure under SHAPECD.

16. LENGTH1 — Length first measurement. The estimated length (in feet) of either side of the pile. Pile length1 may equal pile length2. See figure under SHAPECD.

17. HEIGHT2 — Height second measurement. The estimated height (in feet) of either end of the pile. Pile height1 may equal pile height2. See figure under SHAPECD.

18. WIDTH2 — Width second measurement. The estimated width (in feet) of the side of height2. Pile width1 may equal pile width2. See figure under SHAPECD.

19. LENGTH2 — Length second measurement. The length (in feet) of either side of the pile. Pile length1 may equal pile length2. See figure in SHAPECD.

20. VOLCF — Gross cubic foot volume. The gross volume (in cubic feet) of the pile, calculated with equations based on shape code and pile dimensions. This is an individual pile value and must be multiplied by one of the piles per acre (PPA) columns to obtain per acre information.

21. DRYBIO Dry biomass. The oven-dry weight (in pounds) estimated for the pile. This is an individual pile value and must be multiplied by one of the piles per acre (PPA) columns to obtain per acre information.

22. CARBON Carbon mass. The oven-dry weight of carbon (in pounds) estimated for the pile. This is an individual pile value and must be multiplied by one of the piles per acre (PPA) columns to obtain per acre information.

23. PPA_UNADJ Piles per acre, unadjusted, for population estimates. The number of piles per acre that the pile represents before adjustment for partially nonsampled plots in the stratum. The estimate must be adjusted using factors stored on the POP_STRATUM table to derive population estimates. **Note**: A per acre estimate of the pile is calculated by multiplying PPA_UNADJ and any pile attribute of interest (e.g., DRYBIO).

24. PPA_PLOT Piles per acre, unadjusted, for plot estimates. The number of piles per acre that the pile represents on the individual plot. This estimate is based on the condition area actually sampled on the plot; therefore, it excludes access denied or hazardous conditions. It is used to expand pile attributes for plot-level analyses, where it is important to have an estimate for an individual plot location. This PPA is never adjusted and is not used to derive population estimates.

25. PPA_COND Piles per acre, unadjusted, for condition estimates. The number of piles per acre that the pile represents on one condition on the plot. This estimate is based on the condition area actually sampled on the plot, therefore excludes access denied or hazardous conditions. It is used to expand pile attributes for condition-level analyses, where it is important to have an estimate for an individual condition. This PPA is never adjusted and is not used to derive population estimates.

26. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

27. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

28. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_ INSTANCE description for definition.

29. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

30. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

31. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

Down Woody Material Transect Segment Table (Oracle table name is DWM_TRANSECT_SEGMENT)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	SUBP	Subplot number	NUMBER(1)
8	TRANSECT	Transect code	NUMBER(3)
9	SEGMNT	Segment number	NUMBER(1)
10	MEASYEAR	Measurement year	NUMBER(4)
11	CONDID	Condition class number	NUMBER(1)
12	SLOPE_BEGNDIST	Beginning slope distance	NUMBER
13	SLOPE_ENDDIST	Ending slope distance	NUMBER
14	SLOPE	Percent slope	NUMBER(3)
15	HORIZ_LENGTH	Horizontal length	NUMBER
16	HORIZ_BEGNDIST	Beginning horizontal distance of a coarse woody debris transect segment	NUMBER
17	HORIZ_ENDDIST	Ending horizontal distance of a coarse woody debris transect segment	NUMBER
18	CREATED_BY	Created by	VARCHAR2(30)
19	CREATED_DATE	Created date	DATE
20	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
21	MODIFIED_BY	Modified by	VARCHAR2(30)
22	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
23	MODIFIED_DATE	Modified date	DATE

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	DTS_PK
Unique	PLT_CN, SUBP, TRANSECT, SEGMNT	N/A	DTS_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP, TRANSECT, SEGMNT	N/A	DTS_NAT_I

1. CN — Sequence number. A unique sequence number used to identify a down woody material transect segment record.

2. PLT_CN — Plot sequence number. Foreign key linking the down woody material transect segment record to the plot record.

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

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

6. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of attributes, PLOT may be used to uniquely identify a plot.

7. SUBP — Subplot number. A code indicating the number assigned to the subplot. The national plot design (PLOT.DESIGNCD = 1) has subplot number values of 1 through 4. Other plot designs have various subplot number values. See PLOT.DESIGNCD and appendix I for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 4).

8. TRANSECT — Transect code. A code indicating the transect on which coarse woody debris was measured. Each code represents the azimuth of the transect line, extending out from subplot center.

Code	Transect
030	Transect extends 30 degrees from subplot center
150	Transect extends 150 degrees from subplot center
270	Transect extends 270 degrees from subplot center

9. SEGMNT — Segment number. A number identifying a segment on the transect within one condition, recorded sequentially from subplot center out to the end of the transect. Each condition is given a segment number as it is encountered and mapped along the transect. A segment is a continuous length of line within one condition. Segment number 8 is an office generated segment, indicating field crews did not actually measure or install the segment. Most often, this is for entire subplots that are nonsampled nonforest land.

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

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

12. SLOPE_BEGNDIST

    Beginning slope distance. The location along the CWD transect where the transect begins, as slope distance in feet. A segment is a continuous length of line within one condition. The beginning distance is the point on the transect line where the condition class changes and a new segment begins. If the beginning distance is zero, this is the start of the transect at subplot center. Each segment has a beginning and ending distance recorded as slope distance in the field, measured from the subplot center.

13. SLOPE_ENDDIST

    Ending slope distance. The location along the CWD transect where the segment ends, as slope distance in feet. A segment is a continuous length of line within one condition. The ending distance is the point on the transect line where the condition class of the current segment changes, or the point where the transect ends on the subplot. Each segment has a beginning and ending distance recorded as slope distance in the field.

14. SLOPE Percent slope. The average percent slope of the transect within the condition class being segmented. Slope ranges from 0 to 155 percent.

15. HORIZ_LENGTH

    Horizontal length. The horizontal length of the individual transect segment in feet.

16. HORIZ_BEGNDIST

    Beginning horizontal distance of a coarse woody debris transect segment. The location on the transect where the segment begins in horizontal distance, in feet. A segment is a continuous length of line within one condition. The beginning distance is the point on the transect line where the condition class changes and a new segment begins. If the beginning distance is zero, this is the start of the transect at subplot center. Each segment has a beginning and ending distance recorded as slope distance in the field, which is then converted to horizontal distance.

17. HORIZ_ENDDIST

    Ending horizontal distance of a coarse woody debris transect segment. The location on the transect where the segment ends in horizontal distance, in feet. A segment is a continuous length of line within one condition. The ending distance is the point on the transect line where the condition class of the current segment changes, or the point where the transect ends on the subplot. Each segment has a beginning and ending distance recorded as slope distance in the field, which is then converted to horizontal distance.

18. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

19. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

20. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_ INSTANCE description for definition.

21. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

22. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

23. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

Condition Down Woody Material Calculation Table (Oracle table name is COND_DWM_CALC)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	STATECD	State code	NUMBER(4)
3	COUNTYCD	County code	NUMBER(3)
4	PLOT	Phase 2 plot number	NUMBER
5	MEASYEAR	Measurement year	NUMBER(4)
6	INVYR	Inventory year	NUMBER(4)
7	CONDID	Condition class number	NUMBER(1)
8	EVALID	Evaluation identification	NUMBER(6)
9	PLT_CN	Plot sequence number	VARCHAR2(34)
10	CND_CN	Condition sequence number	VARCHAR2(34)
11	STRATUM_CN	Stratum sequence number	VARCHAR2(34)
12	PHASE	Phase	VARCHAR2(3)
13	CONDPROP_CWD	Proportion of coarse woody debris transects in the condition	NUMBER(13,12)
14	CONDPROP_FWD_SM	Proportion of fine woody debris transects for small-sized pieces, in the condition	NUMBER(13,12)
15	CONDPROP_FWD_MD	Proportion of fine woody debris transects for medium-sized pieces, in the condition	NUMBER(13,12)
16	CONDPROP_FWD_LG	Proportion of fine woody debris transects used to sample large-sized pieces, in the condition	NUMBER(13,12)
17	CONDPROP_DUFF	Proportion of sample points used to measure duff, litter, and fuelbed, in the condition	NUMBER(13,12)
18	CWD_TL_COND	Coarse woody debris transect length in the condition	NUMBER(13,10)
19	CWD_TL_UNADJ	Coarse woody debris transect length, unadjusted	NUMBER(13,10)
20	CWD_TL_ADJ	Coarse woody debris transect length, adjusted	NUMBER(13,10)
21	CWD_LPA_COND	Number of coarse woody debris logs (pieces) per acre in the condition	NUMBER
22	CWD_LPA_UNADJ	Number of coarse woody debris logs (pieces) per acre, unadjusted	NUMBER
23	CWD_LPA_ADJ	Number of coarse woody debris logs (pieces) per acre, adjusted	NUMBER
24	CWD_VOLCF_COND	Coarse woody debris cubic foot volume per acre in the condition	NUMBER
25	CWD_VOLCF_UNADJ	Coarse woody debris cubic foot volume per acre, unadjusted	NUMBER
26	CWD_VOLCF_ADJ	Coarse woody debris cubic foot volume per acre, adjusted	NUMBER
27	CWD_DRYBIO_COND	Coarse woody debris biomass per acre in the condition	NUMBER
28	CWD_DRYBIO_UNADJ	Coarse woody debris biomass per acre,	NUMBER

	Column Name	Descriptive Name	Oracle data type
		unadjusted	
29	CWD_DRYBIO_ADJ	Coarse woody debris biomass per acre, adjusted	NUMBER
30	CWD_CARBON_COND	Coarse woody debris carbon mass per acre in the condition	NUMBER
31	CWD_CARBON_UNADJ	Coarse woody debris carbon mass per acre, unadjusted	NUMBER
32	CWD_CARBON_ADJ	Coarse woody debris carbon mass per acre, adjusted	NUMBER
33	FWD_SM_TL_COND	Small-size class fine woody debris transect length in the condition	NUMBER(13,10)
34	FWD_SM_TL_UNADJ	Small-size class fine woody debris transect length, unadjusted	NUMBER(13,10)
35	FWD_SM_TL_ADJ	Small-size class fine woody debris transect length, adjusted	NUMBER(13,10)
36	FWD_SM_CNT_COND	Small-size class fine woody debris pieces count in the condition	NUMBER
37	FWD_SM_VOLCF_COND	Small-size class fine woody debris cubic foot volume per acre in the condition	NUMBER
38	FWD_SM_VOLCF_UNADJ	Small-size class fine woody debris cubic foot volume per acre, unadjusted	NUMBER
39	FWD_SM_VOLCF_ADJ	Small-size class fine woody debris cubic foot volume per acre, adjusted	NUMBER
40	FWD_SM_DRYBIO_COND	Small-size class fine woody debris biomass per acre in the condition	NUMBER
41	FWD_SM_DRYBIO_UNADJ	Small-size class fine woody debris biomass per acre, unadjusted	NUMBER
42	FWD_SM_DRYBIO_ADJ	Small-size class fine woody debris biomass per acre, adjusted	NUMBER
43	FWD_SM_CARBON_COND	Small-size class fine woody debris carbon mass per acre in the condition	NUMBER
44	FWD_SM_CARBON_UNADJ	Small-size class fine woody debris carbon mass per acre, unadjusted	NUMBER
45	FWD_SM_CARBON_ADJ	Small-size class fine woody debris carbon mass per acre, adjusted	NUMBER
46	FWD_MD_TL_COND	Medium-size class fine woody debris transect length in the condition	NUMBER(13,10)
47	FWD_MD_TL_UNADJ	Medium-size class fine woody debris transect length in all conditions, unadjusted	NUMBER(13,10)
48	FWD_MD_TL_ADJ	Medium-size class fine woody debris transect length, adjusted	NUMBER(13,10)
49	FWD_MD_CNT_COND	Medium-size class fine woody debris pieces count in the condition	NUMBER
50	FWD_MD_VOLCF_COND	Medium-size class fine woody debris cubic foot volume per acre in the condition	NUMBER
51	FWD_MD_VOLCF_UNADJ	Medium-size class fine woody debris cubic foot volume per acre, unadjusted	NUMBER
52	FWD_MD_VOLCF_ADJ	Medium-size class fine woody debris cubic foot volume per acre, adjusted	NUMBER
53	FWD_MD_DRYBIO_COND	Medium-size class fine woody debris biomass per acre in the condition	NUMBER

	Column Name	Descriptive Name	Oracle data type
54	FWD_MD_DRYBIO_UNADJ	Medium-size class fine woody debris biomass per acre, unadjusted	NUMBER
55	FWD_MD_DRYBIO_ADJ	Medium-size class fine woody debris biomass per acre, adjusted	NUMBER
56	FWD_MD_CARBON_COND	Medium-size class fine woody debris carbon mass per acre in the condition	NUMBER
57	FWD_MD_CARBON_UNADJ	Medium-size class fine woody debris carbon mass per acre, unadjusted	NUMBER
58	FWD_MD_CARBON_ADJ	Medium-size class fine woody debris carbon mass per acre, adjusted	NUMBER
59	FWD_LG_TL_COND	Large-size class fine woody debris transect length in the condition	NUMBER(13,10)
60	FWD_LG_TL_UNADJ	Large-size class fine woody debris transect length, unadjusted	NUMBER(13,10)
61	FWD_LG_TL_ADJ	Large-size class fine woody debris transect length, adjusted	NUMBER(13,10)
62	FWD_LG_CNT_COND	Large-size class fine woody debris pieces count in the condition	NUMBER
63	FWD_LG_VOLCF_COND	Large-size class fine woody debris cubic foot volume per acre in the condition	NUMBER
64	FWD_LG_VOLCF_UNADJ	Large-size class fine woody debris cubic foot volume per acre, unadjusted	NUMBER
65	FWD_LG_VOLCF_ADJ	Large-size class fine woody debris cubic foot volume per acre, adjusted	NUMBER
66	FWD_LG_DRYBIO_COND	Large-size class fine woody debris biomass per acre in the condition	NUMBER
67	FWD_LG_DRYBIO_UNADJ	Large-size class fine woody debris biomass per acre, unadjusted	NUMBER
68	FWD_LG_DRYBIO_ADJ	Large-size class fine woody debris biomass per acre, adjusted	NUMBER
69	FWD_LG_CARBON_COND	Large-size class fine woody debris carbon mass per acre in the condition	NUMBER
70	FWD_LG_CARBON_UNADJ	Large-size class fine woody debris carbon mass per acre, unadjusted	NUMBER
71	FWD_LG_CARBON_ADJ	Large-size class fine woody debris carbon mass per acre, adjusted	NUMBER
72	PILE_SAMPLE_AREA_COND	Condition area sampled for piles	NUMBER(13,12)
73	PILE_SAMPLE_AREA_UNADJ	Plot area sampled for piles, in all conditions, unadjusted	NUMBER(13,12)
74	PILE_SAMPLE_AREA_ADJ	Plot area sampled for piles, in all conditions, adjusted	NUMBER(13,12)
75	PILE_VOLCF_COND	Cubic foot volume per acre of piles in the condition	NUMBER
76	PILE_VOLCF_UNADJ	Cubic foot volume per acre of piles, for population estimates, unadjusted	NUMBER
77	PILE_VOLCF_ADJ	Cubic foot volume per acre of piles, for population estimates, adjusted	NUMBER
78	PILE_DRYBIO_COND	Biomass per acre of piles in the condition, for condition estimates	NUMBER
79	PILE_DRYBIO_UNADJ	Biomass per acre of piles, for population estimates, unadjusted	NUMBER
80	PILE_DRYBIO_ADJ	Biomass per acre of piles, for population estimates, adjusted	NUMBER

	Column Name	Descriptive Name	Oracle data type
81	PILE_CARBON_COND	Carbon mass per acre of piles in the condition, for condition estimates	NUMBER
82	PILE_CARBON_UNADJ	Carbon mass per acre of piles, for population estimates, unadjusted	NUMBER
83	PILE_CARBON_ADJ	Carbon mass per acre of piles, for population estimates, adjusted	NUMBER
84	FUEL_DEPTH	Average fuelbed depth in the condition	NUMBER
85	FUEL_BIOMASS	Average fuelbed biomass per acre in the condition	NUMBER
86	FUEL_CARBON	Average fuelbed carbon mass per acre in the condition	NUMBER
87	DUFF_DEPTH	Average duff depth in the condition	NUMBER
88	DUFF_BIOMASS	Average duff biomass per acre in the condition	NUMBER
89	DUFF_CARBON	Average duff carbon per acre in the condition	NUMBER
90	LITTER_DEPTH	Average litter depth in the condition	NUMBER
91	LITTER_BIOMASS	Average litter biomass per acre in the condition	NUMBER
92	LITTER_CARBON	Average litter carbon per acre in the condition	NUMBER
93	DUFF_TC_COND	Number of duff, litter, and fuelbed sampling points in the condition	NUMBER(14,12)
94	DUFF_TC_UNADJ	Number of duff, litter, and fuelbed sampling points on the entire plot, unadjusted	NUMBER(14,12)
95	DUFF_TC_ADJ	Number of duff, litter, and fuelbed sampling points on the entire plot, adjusted	NUMBER(14,12)
96	AVG_WOOD_DENSITY	Average wood density	NUMBER(12,10)
97	CREATED_BY	Created by	VARCHAR2(30)
98	CREATED_DATE	Created date	DATE
99	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
100	MODIFIED_BY	Modified by	VARCHAR2(30)
101	MODIFIED_DATE	Modified date	DATE
102	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
103	CYCLE	Inventory cycle number	NUMBER(2)
104	SUBCYCLE	Inventory subcycle number	NUMBER(2)
105	UNITCD	Survey unit code	NUMBER(2)
106	RSCD	Region or station code	NUMBER(2)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	CDC_PK
Unique	PLT_CN, CONDID, EVALID, RSCD	N/A	CDC_UK
Unique	STATECD, COUNTYCD, PLOT, INVYR, CONDID, EVALID, RSCD	N/A	CDC_UK2

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Unique	STATECD, CYCLE, SUBCYCLE, COUNTYCD, PLOT, CONDID, EVALID, RSCD	N/A	CDC_UK3
Foreign	CND_CN	COND_DWM_CALC to COND	CDC_CND_FK
Foreign	PLT_CN	COND_DWM_CALC to PLOT	CDC_PLT_FK
Foreign	STRATUM_CN	COND_DWM_CALC to POP_STRATUM	CDC_PSM_FK

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

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

1. CN — Sequence number. A unique sequence number used to identify a condition down woody material calculation record in this table.
2. STATECD — State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B.
3. COUNTYCD — County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix B.
4. PLOT — Phase 2 plot number. An identifier for a plot. Along with STATECD, INVYR, UNITCD, COUNTYCD and/or some other combination of variables, PLOT may be used to uniquely identify a plot.
5. MEASYEAR — Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
6. INVYR — Inventory year. See SURVEY.INVYR description for definition.
7. CONDID — Condition class number. The unique identifying number assigned to a condition that exists on the subplot, and is defined in the COND table. See COND.CONDID for details on the attributes which delineate a condition.
8. EVALID — Evaluation identification. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated Phase 1 summary data used to make population estimates.

9. PLT_CN — Plot sequence number. Foreign key linking the condition down woody material calculation record to the plot record.

10. CND_CN — Condition sequence number. This is the same condition record CN in the COND table.

11. STRATUM_CN

    Stratum sequence number. Foreign key linking the condition down woody material calculation record to the population stratum record.

12. PHASE — Phase. This code is used by the PNWRS to indicate the plot design for DWM measurements. Only populated for certain FIA work units (SURVEY.RSCD =26, 27).

Code	Description
P2	A phase 2 plot design
P3	A phase 3 plot design
P23	A phase 2 and phase 3 plot (both designs co-located)

13. CONDPROP_CWD

    Proportion of coarse woody debris transects in the condition. A proportion is developed by summing the CWD transect lengths in one condition and dividing that by the total unadjusted CWD transect length on the plot (CWD_TL_COND/CWD_TL_UNADJ).

14. CONDPROP_FWD_SM

    Proportion of fine woody debris transects for small-sized pieces, in the condition. A proportion is developed by summing the FWD transect lengths in one condition and dividing that by the total unadjusted FWD transect length on the plot (FWD_SM_TL_COND/FWD_SM_TL_UNADJ).

15. CONDPROP_FWD_MD

    Proportion of fine woody debris transects for medium-sized pieces, in the condition. A proportion is developed by summing the FWD transect lengths in one condition and dividing that by the total unadjusted FWD transect length on the plot (FWD_MD_TL_COND/FWD_MD_TL_UNADJ).

16. CONDPROP_FWD_LG

    Proportion of fine woody debris transects used to sample large-sized pieces, in the condition. A proportion is developed by summing the FWD transect lengths in one condition and dividing that by the total unadjusted FWD transect length on the plot (FWD_LG_TL_COND/FWD_LG_TL_UNADJ).

17. CONDPROP_DUFF

    Proportion of sample points used to measure duff, litter, and fuelbed in the condition. A proportion is developed by summing the number of sample points in one condition and dividing that by the total number of points on the plot (DUFF_TC_COND/DUFF_TC_UNADJ).

18. CWD_TL_COND

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

19. CWD_TL_UNADJ

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

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

21. CWD_LPA_COND

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

CWD_TL_COND / (sum of CWD_TL_COND on forest conditions) and then summed to the plot level.

22. CWD_LPA_UNADJ

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

23. CWD_LPA_ADJ

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

24. CWD_VOLCF_COND

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

25. CWD_VOLCF_UNADJ

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

26. CWD_VOLCF_ADJ

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

27. CWD_DRYBIO_COND

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

28. CWD_DRYBIO_UNADJ

    Coarse woody debris biomass per acre, unadjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) from all CWD pieces tallied in one condition on a plot, before adjustment for partially nonsampled plots in the stratum. This attribute is based on the target transect length

(CWD_TL_UNADJ), and is used to calculate population estimates and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_CWD stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS to produce population totals for dry biomass of CWD.

29. CWD_DRYBIO_ADJ

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

30. CWD_CARBON_COND

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

31. CWD_CARBON_UNADJ

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

32. CWD_CARBON_ADJ

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

33. FWD_SM_TL_COND

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

34. FWD_SM_TL_UNADJ

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

35. FWD_SM_TL_ADJ

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

36. FWD_SM_CNT_COND

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

37. FWD_SM_VOLCF_COND

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

38. FWD_SM_VOLCF_UNADJ

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

39. FWD_SM_VOLCF_ADJ

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

40. FWD_SM_DRYBIO_COND

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

multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

41. FWD_SM_DRYBIO_UNADJ

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

42. FWD_SM_DRYBIO_ADJ

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

43. FWD_SM_CARBON_COND

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

44. FWD_SM_CARBON_UNADJ

Small-size class fine woody debris carbon mass per acre, unadjusted. This estimate is the sum of carbon mass per acre (in pounds per acre) of small-size class FWD pieces tallied in one condition on a plot, before adjustment for

partially nonsampled plots in the stratum. This attribute is based on the target transect length (FWD_SM_TL_UNADJ) and is used to calculate population totals and not used to derive estimates for one condition or individual plot. It must be adjusted by the factor ADJ_FACTOR_FWD_SM stored in the POP_STRATUM table and then expanded by the acres in POP_STRATUM.EXPNS before producing population estimates for carbon mass of small-size class FWD.

45. FWD_SM_CARBON_ADJ

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

46. FWD_MD_TL_COND

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

47. FWD_MD_TL_UNADJ

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

48. FWD_MD_TL_ADJ

Medium-size class fine woody debris transect length, adjusted. The sum of all transect lengths (in feet)in all conditions on a plot, as specified by the sampling design. FWD_MD_TL_ADJ (adjusted target transect length) is the maximum length of transect line that would be installed for medium-size class FWD on each subplot across all conditions (forest, nonforest, sampled,

nonsampled) on the plot, after adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the adjusted per-acre attributes of medium-size class FWD, which are columns that end in "_ADJ."

49. FWD_MD_CNT_COND

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

50. FWD_MD_VOLCF_COND

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

51. FWD_MD_VOLCF_UNADJ

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

52. FWD_MD_VOLCF_ADJ

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

table. To expand per acre values to population totals for cubic volume of medium-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

53. FWD_MD_DRYBIO_COND

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

54. FWD_MD_DRYBIO_UNADJ

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

55. FWD_MD_DRYBIO_ADJ

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

56. FWD_MD_CARBON_COND

Medium- size class fine woody debris carbon mass per acre in the condition. This estimate is the sum of carbon mass per acre (in pounds per acre) of medium-size class FWD tallied in one condition on a plot, and is based on transects installed in that condition. This attribute is useful for analysis

projects that involve modeling, mapping, or classifying individual conditions within a plot. **Note**: Because this attribute describes one condition on a plot, it is not used to develop population estimates and is never adjusted. When multiple conditions exist on a plot and one estimate is needed for the plot location (e.g., for a GIS analysis), the plot estimate must be based on the sum of transect lengths from all sampled conditions of interest.

57. FWD_MD_CARBON_UNADJ

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

58. FWD_MD_CARBON_ADJ

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

59. FWD_LG_TL_COND

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

60. FWD_LG_TL_UNADJ

Large-size class fine woody debris transect length, unadjusted. The sum of all transect lengths (in feet) in all conditions on a plot, as specified by the sampling design. FWD_LG_TL_UNADJ (target transect length) is the maximum length of transect line that would be installed for large-size class FWD on each subplot across all conditions (forest, nonforest, sampled,

nonsampled) on the plot, before adjustment for partially nonsampled plots in the stratum. This attribute is used in equations to calculate the unadjusted per-acre attributes of large-size class FWD, which are columns that end in "_UNADJ."

61. FWD_LG_TL_ADJ

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

62. FWD_LG_CNT_COND

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

63. FWD_LG_VOLCF_COND

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

64. FWD_LG_VOLCF_UNADJ

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

65. FWD_LG_VOLCF_ADJ

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

66. FWD_LG_DRYBIO_COND

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

67. FWD_LG_DRYBIO_UNADJ

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

68. FWD_LG_DRYBIO_ADJ

Large-size class fine woody debris biomass per acre, adjusted. This estimate is the sum of dry biomass per acre (in oven-dry pounds per acre) of large-size class FWD pieces tallied in one condition on a plot, after adjustment for partially nonsampled plots in the stratum. This attribute is based on the adjusted target transect length (FWD_LG_TL_ADJ) and is used to calculate

population totals and not used to derive estimates for one condition or individual plot. For ease of use, this attribute has been adjusted by the factor ADJ_FACTOR_FWD_LG stored in the POP_STRATUM table. To expand per acre values to population totals for dry biomass of large-size class FWD, multiply by the acres in POP_STRATUM.EXPNS.

69. FWD_LG_CARBON_COND

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

70. FWD_LG_CARBON_UNADJ

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

71. FWD_LG_CARBON_ADJ

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

72. PILE_SAMPLE_AREA_COND

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

73. PILE_SAMPLE_AREA_UNADJ

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

74. PILE_SAMPLE_AREA_ADJ

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

75. PILE_VOLCF_COND

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

76. PILE_VOLCF_UNADJ

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

77. PILE_VOLCF_ADJ

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

78. PILE_DRYBIO_COND

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

79. PILE_DRYBIO_UNADJ

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

80. PILE_DRYBIO_ADJ

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

81. PILE_CARBON_COND

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

82. PILE_CARBON_UNADJ

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

83. PILE_CARBON_ADJ

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

ADJ_FACTOR_SUBP stored in the POP_STRATUM table before producing population estimates for carbon mass of piles.

84. FUEL_DEPTH Average fuelbed depth in the condition. The average depth (in feet) of the fuelbed in the condition on the plot. Fuelbed depth extends from the start of the litter layer to the highest piece of woody debris found at the sample point. The depth is measured at the 24-foot location of each transect on the subplot. All sample depths collected in one condition are averaged. The column is null if no sample points land in the condition.

85. FUEL_BIOMASS

Average fuelbed biomass per acre in the condition. The average biomass per acre (in oven-dry pounds per acre) of the fuelbed in the condition on the plot.

86. FUEL_CARBON

Average fuelbed carbon mass per acre in the condition. The average carbon mass per acre (in pounds per acre) of the fuelbed in the condition on the plot.

87. DUFF_DEPTH Average duff depth in the condition. The average depth (in inches) of duff in the condition on the plot. Duff depth is measured at the 24-foot location of each transect on the subplot. All sample depths collected in one condition are averaged. The column is null if no sample points land in the condition.

88. DUFF_BIOMASS

Average duff biomass per acre in the condition. The average biomass per acre (in pounds per acre) of duff in the condition on the plot.

89. DUFF_CARBON

Average duff carbon per acre in the condition. The average carbon mass per acre (in pounds per acre) of duff in the condition on the plot.

90. LITTER_DEPTH

Average litter depth in the condition. The average depth (in inches) of litter in the condition on the plot. Litter depth is measured at the 24 foot location of each transect on the subplot. All sample depths collected in one condition are averaged. The column is null if no sample points land in the condition.

91. LITTER_BIOMASS

Average litter biomass per acre in the condition. The average biomass per acre (in oven-dry pounds per acre) of litter in the condition on the plot.

92. LITTER_CARBON

    Average litter carbon per acre in the condition. The average carbon mass per acre (in pounds per acre) of litter in the condition on the plot.

93. DUFF_TC_COND

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

94. DUFF_TC_UNADJ

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

95. DUFF_TC_ADJ

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

96. AVG_WOOD_DENSITY

    Average wood density. Average dry wood density in pounds per cubic foot computed by summing density of all live trees of known species weighted by cubic foot volume. This value is only used to estimate biomass of FWD where species is not recorded.

97. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

98. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

99. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

100. MODIFIED_BY

Modified by. See SURVEY.MODIFIED_BY description for definition.

101. MODIFIED_DATE

Modified date. See SURVEY.MODIFIED_DATE description for definition.

102. MODIFIED_IN_INSTANCE

Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

103. CYCLE Inventory cycle number. See SURVEY.CYCLE description for definition.

104. SUBCYCLE Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

105. UNITCD Unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

106. RSCD Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS)-Alaska
33	Southern Research Station (SRS)

Population Estimation Unit Table (Oracle table name is POP_ESTN_UNIT)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	EVAL_CN	Evaluation sequence number	VARCHAR2(34)
3	RSCD	Region or station code	NUMBER(2)
4	EVALID	Evaluation identifier	NUMBER(6)
5	ESTN_UNIT	Estimation unit	NUMBER(6)
6	ESTN_UNIT_DESCR	Estimation unit description	VARCHAR2(255)
7	STATECD	State code	NUMBER(4)
8	AREALAND_EU	Land area within the estimation unit	NUMBER(12,2)
9	AREATOT_EU	Total area within the estimation unit	NUMBER(12,2)
10	AREA_USED	Area used to calculate all expansion factors	NUMBER(12,2)
11	AREA_SOURCE	Area source	VARCHAR2(50)
12	P1PNTCNT_EU	Phase 1 point count for the estimation unit	NUMBER(12)
13	P1SOURCE	Phase 1 source	VARCHAR2(50)
14	CREATED_BY	Created by	VARCHAR2(30)
15	CREATED_DATE	Created date	DATE
16	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
17	MODIFIED_BY	Modified by	VARCHAR2(30)
18	MODIFIED_DATE	Modified date	DATE
19	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PEU_PK
Unique	RSCD, EVALID, ESTN_UNIT	N/A	PEU_UK
Foreign	EVAL_CN	POP_ESTN_UNIT to POP_EVAL	PEU_PEV_FK

1. CN — Sequence number. A unique sequence number used to identify a population estimation unit record.

2. EVAL_CN — Evaluation sequence number. Foreign key linking the estimation unit record to the evaluation record.

3. RSCD — Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS)-Alaska
33	Southern Research Station (SRS)

4. EVALID Evaluation identifier. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated Phase 1 summary data used to make population estimates.

5. ESTN_UNIT Estimation unit. The specific geographic area that is stratified. Estimation units are often determined by a combination of geographical boundaries, sampling intensity and ownership.

6. ESTN_UNIT_DESCR

   Estimation unit description. A description of the estimation unit (e.g., name of the county).

7. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B. For evaluations that do not conform to the boundaries of a single State the value of STATECD should be set to 99.

8. AREALAND_EU

   Land area within the estimation unit. The area of land in acres enclosed by the estimation unit. Census water is excluded.

9. AREATOT_EU

   Total area within the estimation unit. This includes land and census water enclosed by the estimation unit.

10. AREA_USED Area used to calculate all expansion factors. Is equivalent to AREATOT_EU if a station estimates all area, including census water; and to AREALAND_EU if a station estimates land area only.

11. AREA_SOURCE

    Area Source. Identifies the source of the area numbers. Usually the area source is either the U.S. Census Bureau or area estimates based on pixel counts. Example values are “US CENSUS 2000” or “PIXEL COUNT.”

12. P1PNTCNT_EU

    Phase 1 point count for the estimation unit. For remotely sensed data this will be the total number of pixels in the estimation unit.

13. P1SOURCE Phase 1 source. Identifies the Phase 1 data source used for this stratification. Examples are NLCD and AERIAL PHOTOS.

14. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

15. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

16. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

17. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

18. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

19. MODIFIED_IN _INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Population Evaluation Table (Oracle table name is POP_EVAL)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	EVAL_GRP_CN	Evaluation group sequence number	VARCHAR2(34)
3	RSCD	Region or Station code	NUMBER(2)
4	EVALID	Evaluation identifier	NUMBER(6)
5	EVAL_DESCR	Evaluation description	VARCHAR2(255)
6	STATECD	State code	NUMBER(4)
7	LOCATION_NM	Location name	VARCHAR2(255)
8	REPORT_YEAR_NM	Report year name	VARCHAR2(255)
9	START_INVYR	Start inventory year	NUMBER(4)
10	END_INVYR	End inventory year	NUMBER(4)
11	LAND_ONLY	Land only	VARCHAR2(1)
12	TIMBERLAND_ONLY	Timberland only	VARCHAR2(1)
13	GROWTH_ACCT	Growth accounting	VARCHAR2(1)
14	ESTN_METHOD	Estimation method	VARCHAR2(40)
15	NOTES	Notes	VARCHAR2(2000)
16	CREATED_BY	Created by	VARCHAR2(30)
17	CREATED_DATE	Created date	DATE
18	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
19	MODIFIED_BY	Modified by	VARCHAR2(30)
20	MODIFIED_DATE	Modified date	DATE
21	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PEV_PK
Unique	RSCD, EVALID	N/A	PEV_UK
Foreign	EVAL_GRP_CN	POP_EVAL to POP_EVAL_GRP	PEV_PEG_FK

1. CN — Sequence number. A unique sequence number used to identify a population evaluation record.

2. EVAL_GRP_CN

   Evaluation group sequence number. Foreign key linking the population evaluation record to the population evaluation group record.

3. RSCD — Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS)-Alaska
33	Southern Research Station (SRS)

4. EVALID — Evaluation identifier. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated Phase 1 summary data used to make population estimates.

5. EVAL_DESCR

   Evaluation description. A description of the area being evaluated (often a State), the time period of the evaluation, and the type of estimates the evaluation can be used to compute (e.g., all lands, area, volume, growth, removals, and mortality).

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

7. LOCATION_NM

   Location name. Geographic area as it would appear in the title of a report.

8. REPORT_YEAR_NM

   Report year name. The data collection years that would appear in the title of a report.

9. START_INVYR

   Start inventory year. The starting year for the data included in the evaluation.

10. END_INVYR — End inventory year. The ending year for the data included in the evaluation.

11. LAND_ONLY — Land only. A code indicating area used in stratifying evaluations. See POP_ESTN_UNIT.AREA_SOURCE for more information.

Code	Description
Y	Only census land was used in the stratification process.
N	Census land and water were used in the stratification process.

12. TIMBERLAND_ONLY

    Timberland only. A code indicting if the estimate can be made for timberland or for timberland and forest land. Timberland is a subset of forest land defined as nonreserved forest land capable of producing at least 20 cubic feet

of wood volume per acre per year (COND. COND_STATUS_CD = 1, COND.RESERVCD = 0, COND.SITECLCD < 7).

Code	Description
Y	Only timberland attributes can be estimated for the evaluation.
N	Both timberland and forest land attributes can be estimated for the evaluation.

13. GROWTH_ACCT

Growth accounting. A code indicating whether the evaluation can be used for growth accounting. This attribute is blank (null) when the POP_EVAL_TYP.EVAL_TYP is not 'EXPGROW' evaluation type. See chapter 4 for examples of the growth accounting method.

Code	Description
Y	The evaluation can be used for growth accounting.
N	The evaluation cannot be used for growth accounting.

14. ESTN_METHOD

Estimation method. Describe method of estimation. Post-stratification is used for most inventories where PLOT.MANUAL ≥1.0.

Values
Simple random sampling
Stratified random sampling
Double sampling for stratification
Post-stratification
Subsampling units of unequal size

15. NOTES Notes. Notes should include information about the stratification method. May include citation for any publications that used the evaluation.

16. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

17. CREATED_DATE

Created date. See SURVEY.CREATED_DATE description for definition.

18. CREATED_IN_INSTANCE

Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

19. MODIFIED_BY

Modified by. See SURVEY.MODIFIED_BY description for definition.

20. MODIFIED_DATE

Modified date. See SURVEY.MODIFIED_DATE description for definition.

21 MODIFIED_IN_INSTANCE

Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Population Evaluation Attribute Table (Oracle table name is POP_EVAL_ATTRIBUTE)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	EVAL_CN	Evaluation sequence number	VARCHAR2(34)
3	ATTRIBUTE_NBR	Attribute number	NUMBER(3)
4	STATECD	State code	NUMBER(4)
5	CREATED_BY	Created by	VARCHAR2(30)
6	CREATED_DATE	Created date	DATE
7	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
8	MODIFIED_BY	Modified by	VARCHAR2(30)
9	MODIFIED_DATE	Modified date	DATE
10	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Unique	EVAL_CN, ATTRIBUTE_NBR	N/A	PEA_UK
Foreign	ATTRIBUTE_NBR	POP_EVAL_ATTRIBUTE to REF_POP_ATTRIBUTE	PEA_PAE_FK
Foreign	EVAL_CN	POP_EVAL_ATTRIBUTE to POP_EVAL	PEA_PEV_FK

1. CN Sequence number. A unique sequence number used to identify a population evaluation attribute record.

2. EVAL_CN Evaluation sequence number. Foreign key linking the population evaluation attribute record to the population evaluation record.

3. ATTRIBUTE_NBR

   Attribute number. Foreign key linking the population evaluation attribute record to the reference population attribute record.

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

5. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

6. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

7. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

8. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

9. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

10. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Population Evaluation Group Table (Oracle table name is POP_EVAL_GRP)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	RSCD	Region or Station code	NUMBER(2)
3	EVAL_GRP	Evaluation group	NUMBER(6)
4	EVAL_GRP_DESCR	Evaluation group description	VARCHAR2(255)
5	STATECD	State code	NUMBER(4)
6	NOTES	Notes	VARCHAR2(2000)
7	CREATED_BY	Created by	VARCHAR2(30)
8	CREATED_DATE	Created date	DATE
9	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
10	MODIFIED_BY	Modified by	VARCHAR2(30)
11	MODIFIED_DATE	Modified date	DATE
12	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PEG_PK
Unique	RSCD, EVAL_GRP	N/A	PEG_UK

1. CN — Sequence number. A unique sequence number used to identify a population evaluation group record.

2. RSCD — Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS)-Alaska
33	Southern Research Station (SRS)

3 EVAL_GRP — Evaluation group. An evaluation group identifies the evaluations that were used in producing a core set of tables. In some cases one evaluation will be used for area and volume and another evaluation for growth, removals and mortality. The value of this attribute is used to select the appropriate State and year of interest to produce a set of summary tables.

4. EVAL_GRP_DESCR

Evaluation group description. A description of the evaluation group that includes the State and range of years for the evaluation, for example,

"Minnesota: 2004;2005;2006;2007;2008". This is useful to include in a summary report to clearly identify the source of the data.

5. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B. For evaluations that do not conform to the boundaries of a single State the value of STATECD should be set to 99.

6. NOTES Notes. Population evaluation group notes.

7. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

8. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

9. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

10. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

11. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

12. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Population Evaluation Type Table (Oracle table name is POP_EVAL_TYP)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	EVAL_GRP_CN	Evaluation group sequence number	VARCHAR2(34)
3	EVAL_CN	Evaluation sequence number	VARCHAR2(34)
4	EVAL_TYP	Evaluation type	VARCHAR2(15)
5	CREATED_BY	Created by	VARCHAR2(30)
6	CREATED_DATE	Created date	DATE
7	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
8	MODIFIED_BY	Modified by	VARCHAR2(30)
9	MODIFIED_DATE	Modified date	DATE
10	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PET_PK
Unique	EVAL_GRP_CN, EVAL_CN, EVAL_TYP	N/A	PET_UK
Foreign	EVAL_GRP_CN	POP_EVAL_TYP to POP_EVAL_GRP	PET_PEG_FK
Foreign	EVAL_CN	POP_EVAL_TYP to POP_EVAL	PET_PEV_FK
Foreign	EVAL_TYP	POP_EVAL_TYP to REF_POP_EVAL_TYP_DESCR	PET_PED_FK

1. CN — Sequence number. A unique sequence number used to identify a population evaluation type record

2. EVAL_GRP_CN

   Evaluation group sequence number. Foreign key linking the population evaluation type record to the population evaluation group record.

3. EVAL_CN — Evaluation sequence number. Foreign key linking the population evaluation type record to the population evaluation record.

4. EVAL_TYP — Evaluation type. Describes the type of evaluation. Evaluation type is needed to generate summary reports for an inventory. For example, a specific evaluation is associated with the evaluation for tree volume (EXPVOL). At the present time, seven types of evaluations can be produced. See also the REF_POP_EVAL_TYP_DESCR table.

Evaluation type	Evaluation type description
EXPALL	All plots: sampled and nonsampled.
EXPCHNG	Sampled plots used for area change estimates.
EXPCURR	Sampled plots used for current area and condition-level estimates.
EXPDWM	Sampled plots used for down woody material estimates.
EXPGROW	Sampled plots used for tree growth estimates.
EXPMORT	Sampled plots used for tree mortality estimates.
EXPREMV	Sampled plots used for tree removal estimates.
EXPVOL	Sampled plots used for tree inventory estimates.

5. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

6. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

7. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

8. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

9. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

10. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Population Plot Stratum Assignment Table (Oracle table name is POP_PLOT_STRATUM_ASSGN)

	Colum name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	STRATUM_CN	Stratum sequence number	VARCHAR2(34)
3	PLT_CN	Plot sequence number	VARCHAR2(34)
4	STATECD	State code	NUMBER(4)
5	INVYR	Inventory year	NUMBER(4)
6	UNITCD	Survey unit code	NUMBER(2)
7	COUNTYCD	County code	NUMBER(3)
8	PLOT	Phase 2 plot number	NUMBER(5)
9	RSCD	Region or Station code	NUMBER(2)
10	EVALID	Evaluation identifier	NUMBER(6)
11	ESTN_UNIT	Estimation unit	NUMBER(6)
12	STRATUMCD	Stratum code	NUMBER(6)
13	CREATED_BY	Created by	VARCHAR2(30)
14	CREATED_DATE	Created date	DATE
15	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
16	MODIFIED_BY	Modified by	VARCHAR2(30)
17	MODIFIED_DATE	Modified date	DATE
18	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PPSA_PK
Unique	RSCD, EVALID, STATECD, COUNTYCD, PLOT	N/A	PPSA_UK
Foreign	PLT_CN	POP_PLOT_STRATUM_ASSGN to PLOT	PPSA_PLT_FK
Foreign	STRATUM_CN	POP_PLOT_STRATUM_ASSGN to POP_STRATUM	PPSA_PSM_FK

1. CN — Sequence number. A unique sequence number used to identify a population plot stratum assignment record.

2. STRATUM_CN

   Stratum sequence number. Foreign key linking the population plot stratum assignment record to the population stratum record.

3. PLT_CN — Plot sequence number. Foreign key linking the population plot stratum assignment record to the plot record.

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

5. INVYR Inventory year. See SURVEY.INVYR description for definition.

6. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

8. PLOT Phase 2 plot number. An identifier for a plot. Along with INVYR, STATECD, UNITCD, COUNTYCD, PLOT may be used to uniquely identify a plot.

9. RSCD Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS) - Alaska
33	Southern Research Station (SRS)

10. EVALID Evaluation identifier. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated Phase 1 summary data used to make population estimates.

11. ESTN_UNIT Estimation unit. A geographic area upon which stratification is performed. Sampling intensity is uniform within an estimation unit.

12. STRATUMCD Stratum code. The code used for a particular stratum, which is unique within an RSCD, EVALID, ESTN_UNIT.

13. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

14. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

15. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

16. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

17. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

18. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Population Stratum Table (Oracle table name is POP_STRATUM)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	ESTN_UNIT_CN	Estimation unit sequence number	VARCHAR2(34)
3	RSCD	Region or Station code	NUMBER(2)
4	EVALID	Evaluation identifier	NUMBER(6)
5	ESTN_UNIT	Estimation unit	NUMBER(6)
6	STRATUMCD	Stratum code	NUMBER(6)
7	STRATUM_DESCR	Stratum description	VARCHAR2(255)
8	STATECD	State code	NUMBER(4)
9	P1POINTCNT	Phase 1 point count	NUMBER(12)
10	P2POINTCNT	Phase 2 point count	NUMBER(12)
11	EXPNS	Expansion factor	NUMBER
12	ADJ_FACTOR_MACR	Adjustment factor for the macroplot	NUMBER
13	ADJ_FACTOR_SUBP	Adjustment factor for the subplot	NUMBER
14	ADJ_FACTOR_MICR	Adjustment factor for the microplot	NUMBER
15	ADJ_FACTOR_CWD	Adjustment factor for coarse woody debris	NUMBER
16	ADJ_FACTOR_FWD_SM	Adjustment factor for small fine woody debris	NUMBER
17	ADJ_FACTOR_FWD_LG	Adjustment factor for large fine woody debris	NUMBER
18	ADJ_FACTOR_DUFF	Adjustment factor for the duff and litter layer	NUMBER
19	CREATED_BY	Created by	VARCHAR2(30)
20	CREATED_DATE	Created date	DATE
21	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
22	MODIFIED_BY	Modified by	VARCHAR2(30)
23	MODIFIED_DATE	Modified date	DATE
24	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PSM_PK
Unique	RSCD, EVALID, ESTN_UNIT, STRATUMCD	N/A	PSM_UK
Foreign	ESTN_UNIT_CN	POP_STRATUM to POP_ESTN_UNIT	PSM_PEU_FK

1. CN Sequence number. A unique sequence number used to identify a stratum record.

2. ESTN_UNIT_CN

   Estimation unit sequence number. Foreign key linking the stratum record to the estimation unit record.

3. RSCD Region or Station Code. Identification number of the Forest Service National Forest System Region or Station (FIA work unit) that provided the inventory data (see appendix B for more information).

Code	Description
22	Rocky Mountain Research Station (RMRS)
23	North Central Research Station (NCRS)
24	Northeastern Research Station (NERS)
26	Pacific Northwest Research Station (PNWRS)
27	Pacific Northwest Research Station (PNWRS)-Alaska
33	Southern Research Station (SRS)

4. EVALID Evaluation identifier. The EVALID code and the RSCD code together uniquely identify a set of field plots and associated Phase 1 summary data used to make population estimates.

5. ESTN_UNIT Estimation unit. The particular geographic area for which a particular computation applies. Estimation units are determined by a combination of sampling intensity and geographical boundaries.

6. STRATUMCD Stratum code. A number used to uniquely identify a stratum within an estimation unit.

7. STRATUM_DESCR

   Stratum description. Strata are usually based on land use (e.g., forest or nonforest) but may also be based on other criteria such as ownership (e.g., private/public/national forest).

8. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B. For evaluations that do not conform to the boundaries of a single State the value of STATECD should be set to 99.

9. P1POINTCNT Phase 1 point count. The number of basic units (pixels or points) in the stratum.

10. P2POINTCNT Phase 2 point count. The number of field plots that are within the stratum.

11. EXPNS Expansion factor. The area, in acres, that a stratum represents divided by the number of sampled plots in that stratum: EXPNS=(POP_ESTN_UNIT.AREA_USED*P1POINTCNT/POP-ESTN_UNIT.P1PNTCNT_EU)/P2POINTCNT. This attribute can be used to obtain estimates of population area when summed across all the plots in the population of interest. Refer to chapter 4 for detailed examples.

12. ADJ_FACTOR_MACR

    Adjustment factor for the macroplot. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions). It is used with condition proportion (COND.CONDPROP_UNADJ) and area expansion (EXPNS) to provide area estimates, when COND.PROP_BASIS = "MACR". ADJ_FACTOR_MACR is also used with EXPNS and trees per acre unadjusted (TREE.TPA_UNADJ, TREE.TPAMORT_UNADJ, TREE.TPAREMV_UNADJ, TREE.TPAGROW_UNADJ) to provide tree estimates for sampled land. If a macroplot was not installed, this attribute is left blank (null). Refer to chapter 4 for detailed examples.

13. ADJ_FACTOR_SUBP

    Adjustment factor for the subplot. A value that adjusts the population estimates to account for partially nonsampled plots (access denied and hazardous portions). It is used with condition proportion (COND.CONDPROP_UNADJ) and area expansion (EXPNS) to provide area estimates, when COND.PROP_BASIS = "SUBP". ADJ_FACTOR_SUBP is also used with EXPNS and trees per acre unadjusted (TREE.TPA_UNADJ, TREE.TPAMORT_UNADJ, TREE.TPAREMV_UNADJ, TREE.TPAGROW_UNADJ) to provide tree estimates for sampled land. Refer to chapter 4 for detailed examples.

14. ADJ_FACTOR_MICR

    Adjustment factor for the microplot. A value that adjusts population estimates to account for partially nonsampled plots (access denied and hazardous portions). It is used with POP_STRATUM.EXPNS and seedlings per acre unadjusted (SEEDLING.TPA_UNADJ) or saplings per acre unadjusted (TREE.TPA_UNADJ where TREE DIA <5.0) to provide tree estimates for sampled land. Refer to chapter 4 for detailed examples.

15. ADJ_FACTOR_CWD

    Adjustment factor for coarse woody debris. Ratio of transect length that was sampled for coarse woody debris on all partially and fully sampled plots in stratum.

16. ADJ_FACTOR_FWD_SM

    Adjustment factor for small fine woody debris. Ratio of transect length that was sampled for small fine woody debris on all partially and fully sampled plots in stratum.

17. ADJ_FACTOR_FWD_LG

    Adjustment factor for large fine woody debris. Ratio of transect length that was sampled for large fine woody debris on all partially and fully sampled plots in stratum.

18. ADJ_FACTOR_DUFF

    Adjustment factor for duff. Ratio of points that were sampled for duff and litter to target number of points for all partially and fully sampled plots in stratum.

19. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

20. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

21. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

22. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

23. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

24. MODIFIED_IN _INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Plot Geometry Table (Oracle table name is PLOTGEOM)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	STATECD	State code	NUMBER
3	INVYR	Inventory year	NUMBER
4	UNITCD	Unit code	NUMBER
5	COUNTYCD	County code	NUMBER
6	PLOT	Phase 2 plot number	NUMBER
7	LAT	Latitude	NUMBER
8	LON	Longitude	NUMBER
9	CONGCD	Congressional district code	NUMBER
10	ECOSUBCD	Ecological subsection code	VARCHAR2(7)
11	HUC	Hydrologic unit code	NUMBER
12	EMAP_HEX	EMAP hexagon	NUMBER
13	FIPSCOUNTY	FIPS county code	NUMBER
14	ROADLESSCD	Roadless code	VARCHAR2(4)
15	CREATED_BY	Created by	VARCHAR2(30)
16	CREATED_DATE	Created date	DATE
17	CREATED_IN_INSTANCE	Created in instance	NUMBER(6)
18	MODIFIED_BY	Modified by	VARCHAR2(30)
19	MODIFIED_DATE	Modified date	DATE
20	MODIFIED_IN_INSTANCE	Modified in instance	NUMBER(6)
21	ADFORCD	Administrative forest code	NUMBER

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PLOTGEOM_PK
Foreign	CN	PLOTGEOM to PLOT	PLOTGEOM_PLT_FK

1. CN — Sequence number. A unique sequence number used to identify a plot geom record, and is equal to the CN identifier in the PLOT table.

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

3. INVYR — Inventory year. See SURVEY.INVYR description for definition.

4. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

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

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

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

9. CONGCD — Congressional district code. A territorial division of a State from which a member of the U.S. House of Representatives is elected. The congressional district code assigned to a plot (regardless of when it was measured) is for the current Congress; the assignment is made based on the plot's approximate coordinates. CONGCD is a four-digit number. The first two digits are the State FIPS code and the last two digits are the congressional district number. If a State has only one congressional district, the congressional district number is 00. If a plot's congressional district assignment falls in a State other than the plot's actual State due to using the approximate coordinates, the congressional district code will be for the nearest congressional district in the correct State. This attribute is coded for the coterminous States and Alaska, and is left blank (null) in all other instances. For more information about the coverage used to assign this attribute, see National Atlas of the United States (2007).

10 . ECOSUBCD — Ecological subsection code. An area of similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities. Subsection boundaries usually correspond with discrete changes in geomorphology. Subsection information is used for broad planning and assessment. Subsection codes for the coterminous United States were developed as part of the "Forest Service Map of Provinces, Sections, and Subsections of the United States (Cleland and others 2007) (visit

http://fsgeodata.fs.fed.us/other_resources/ecosubregions.html). For southeast and south coastal Alaska, the subsection codes are based on the ecological sections as designated in the "Ecoregions and Subregions of Alaska, EcoMap version 2.0" (Nowacki and Brock 1995) (visit http://agdcftp1.wr.usgs.gov/pub/projects/fhm/ecomap.gif). The ECOSUBCD is based on fuzzed and swapped plot coordinates. This attribute is coded for the coterminous United States, southeast and south coastal Alaska, and is left blank (null) in all other instances.

11. HUC — Hydrologic unit code. A code representing a watershed area that is the fourth-level hydrological subdivision as classified by the USGS National Water Information System (NWIS). Url: http://water.usgs.gov/GIS/huc.html.

12. EMAP_HEX — EMAP hexagon. The identifier for the approximately 160,000 acre Environmental Monitoring and Assessment Program (EMAP) hexagon in which the plot is located. EMAP hexagons are available to the public, cover the coterminous United States, and have been used in summarizing and aggregating data about numerous natural resources. Populated for annual inventory and may be populated for periodic inventory.

13. FIPSCOUNTY — FIPS county code. State code concatenated with the county code.

14. ROADLESSCD

Roadless code. Code representing the management type of the inventoried roadless area the plot falls in, as designated by USDA Forest Service, within the National Forest System lands. The current metadata file is available at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm8_037001.html

Code	Description
1B	Inventoried Roadless Areas where road construction and reconstruction is prohibited
1B-1	Inventoried Roadless Areas that are recommended for wilderness designation in the forest plan and where road construction and reconstruction is prohibited
1C	Inventoried Roadless Areas where road construction and reconstruction is not prohibited.

15. CREATED_BY — Created by. See SURVEY.CREATED_BY description for definition.

16. CREATED_DATE

Created date. See SURVEY.CREATED_DATE description for definition.

17. CREATED_IN_INSTANCE

Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

18. MODIFIED_BY

Modified by. See SURVEY.MODIFIED_BY description for definition.

19. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

20. MODIFIED_IN _INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

21. ADFORCD — Administrative forest code. Identifies the administrative unit (Forest Service Region and National Forest) in which the plot center is located. The first two digits of the four digit code are for the region number and the last two digits are for the Administrative National Forest number. Based solely on the most recent ALP (Automated Lands Program) layers (BASICOWNERSHIP and ADMINISTRATIVEFOREST) and the exact plot location. A plot can be assigned an ADFORCD irrespective of the plot's OWNCD value(s). Refer to appendix C for codes.

Plot Snapshot Table (Oracle table name is PLOTSNAP)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	SRV_CN	Survey sequence number	VARCHAR2(34)
3	CTY_CN	County sequence number	VARCHAR2(34)
4	PREV_PLT_CN	Previous plot sequence number	VARCHAR2(34)
5	INVYR	Inventory year	NUMBER(4)
6	STATECD	State code	NUMBER(4)
7	UNITCD	Unit code	NUMBER(2)
8	COUNTYCD	County code	NUMBER(3)
9	PLOT	Phase 2 plot number	NUMBER(5)
10	PLOT_STATUS_CD	Plot status code	NUMBER(1)
11	PLOT_NONSAMPLE_REASN_CD	Plot nonsampled reason code	NUMBER(2)
12	MEASYEAR	Measurement year	NUMBER(4)
13	MEASMON	Measurement month	NUMBER(2)
14	MEASDAY	Measurement day	NUMBER(2)
15	REMPER	Remeasurement period	NUMBER(3,1)
16	KINDCD	Sample kind code	NUMBER(2)
17	DESIGNCD	Design code	NUMBER(4)
18	RDDISTCD	Horizontal distance to improved road	NUMBER(2)
19	WATERCD	Water on plot code	NUMBER(2)
20	LAT	Latitude	NUMBER(8,6)
21	LON	Longitude	NUMBER(9,6)
22	ELEV	Elevation	NUMBER(5)
23	GROW_TYP_CD	Type of annual volume growth code	NUMBER(2)
24	MORT_TYP_CD	Mortality type code	NUMBER(2)
25	P2PANEL	Phase 2 panel number	NUMBER(2)
26	P3PANEL	Phase 3 panel number	NUMBER(2)
27	ECOSUBCD	Ecological subsection code	VACHAR2(7)
28	CONGCD	Congressional district code	NUMBER(4)
29	MANUAL	Manual (field guide) version number	NUMBER(3,1)
30	SUBPANEL	Subpanel number	NUMBER(2)
31	KINDCD_NC	Kind code, North Central	NUMBER(2)
32	QA_STATUS	Quality assurance status	NUMBER(1)
33	CREATED_BY	Created by	VARCHAR2(30)
34	CREATED_DATE	Created date	DATE
35	CREATED_IN_INSTANCE	Created in instance	NUMBER(6)
36	MODIFIED_BY	Modified by	VARCHAR2(30)

	Column name	Descriptive name	Oracle data type
37	MODIFIED_DATE	Modified date	DATE
38	MODIFIED_IN_INSTANCE	Modified in instance	NUMBER(6)
39	MICROPLOT_LOC	Microplot location	VARCHAR2(12)
40	DECLINATION	Declination	NUMBER(4,1)
41	EMAP_HEX	EMAP hexagon number	NUMBER(7)
42	SAMP_METHOD_CD	Sample method code	NUMBER(1)
43	SUBP_EXAMINE_CD	Subplots examined code	NUMBER(1)
44	MACRO_BREAKPOINT_DIA	Macroplot breakpoint diameter	NUMBER(2)
45	INTENSITY	Intensity	VARCHAR2(2)
46	CYCLE	Inventory cycle number	NUMBER(2)
47	SUBCYCLE	Inventory subcycle number	NUMBER(2)
48	ECO_UNIT_PNW	Ecological unit, Pacific Northwest Research Station	VARCHAR2(10)
49	TOPO_POSITION_PNW	Topographic position, Pacific Northwest Research Station	VARCHAR2(2)
50	EVAL_GRP_CN	Evaluation group sequence number	VARCHAR2(34)
51	EVAL_GRP	Evaluation group	NUMBER(6)
52	EXPALL	Area expansion factor for all land	NUMBER(13,4)
53	EXPCURR	Area expansion factor for forest land and timberland	NUMBER(13,4)
54	EXPVOL	Volume expansion factor for forest land and timberland	NUMBER(13,4)
55	EXPGROW	Growth expansion factor for forest land and timberland	NUMBER(13,4)
56	EXPMORT	Mortality expansion factor for forest land and timberland	NUMBER(13,4)
57	EXPREMV	Removals expansion factor for forest land and timberland	NUMBER(13,4)
58	ADJ_EXPALL	Adjustment factor for all land area	NUMBER(5,4)
59	ADJ_EXPCURR	Adjustment factor for forest land and timberland area	NUMBER(5,4)
60	ADJ_EXPVOL_MACR	Macroplot adjustment factor for volume estimation	NUMBER(5,4)
61	ADJ_EXPVOL_SUBP	Subplot adjustment factor for volume estimation	NUMBER(5,4)
62	ADJ_EXPVOL_MICR	Microplot adjustment factor for volume estimation	NUMBER(5,4)
63	ADJ_EXPGROW_MACR	Macroplot adjustment factor for growth estimation	NUMBER(5,4)
64	ADJ_EXPGROW_SUBP	Subplot adjustment factor for growth estimation	NUMBER(5,4)
65	ADJ_EXPGROW_MICR	Microplot adjustment factor for growth estimation	NUMBER(5,4)
66	ADJ_EXPMORT_MACR	Macroplot adjustment factor for mortality estimation	NUMBER(5,4)
67	ADJ_EXPMORT_SUBP	Subplot adjustment factor for mortality estimation	NUMBER(5,4)

	Column name	Descriptive name	Oracle data type
68	ADJ_EXPMORT_MICR	Microplot adjustment factor for mortality estimation	NUMBER(5,4)
69	ADJ_EXPREMV_MACR	Macroplot adjustment factor for removals estimation	NUMBER(5,4)
70	ADJ_EXPREMV_SUBP	Subplot adjustment factor for removals estimation	NUMBER(5,4)
71	ADJ_EXPREMV_MICR	Microplot adjustment factor for removals estimation	NUMBER(5,4)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN, EVAL_GRP_CN	N/A	PLOTSNP_PK
Foreign	STATECD, EVAL_GRP	PLOTSNAP to POP_EVAL_GRP	PLOTSNP_PEG_FK_I
Foreign	EVAL_GRP_CN	PLOTSNAP to POP_EVAL_GRP	PLOTSNP_PEG_FK_I2

1. CN — Sequence number. A unique sequence number (equal to the CN identifier in the PLOT table), which, combined with the EVAL_GRP_CN, is used to identify a snapshot record.

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

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

4. PREV_PLT_CN

   Previous plot sequence number. Foreign key linking the snapshot record to the previous inventory's plot record for this location. Only populated on remeasurement plots.

5. INVYR — Inventory year. See SURVEY.INVYR description for definition.

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

7. UNITCD — Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, Survey units may be made up of lands of particular owners. Refer to appendix B for codes.

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

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

10. PLOT_STATUS_CD

Plot status code. A code that describes the sampling status of the plot. Blank (null) values may be present for periodic inventories.

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

11. PLOT_NONSAMPLE_REASN_CD

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

Code	Description
01	Outside U.S. boundary – Entire plot is outside of the U.S. border.
02	Denied access area – Access to the entire plot is denied by the legal owner, or by the owner of the only reasonable route to the plot.
03	Hazardous – Entire plot cannot be accessed because of a hazard or danger, for example cliffs, quarries, strip mines, illegal substance plantations, high water, etc.
05	Lost data – Plot data file was discovered to be corrupt after a panel was completed and submitted for processing.
06	Lost plot – Entire plot cannot be found.
07	Wrong location – Previous plot can be found, but its placement is beyond the tolerance limits for plot location.
08	Skipped visit – Entire plot skipped. Used for plots that are not completed prior to the time a panel is finished and submitted for processing. This code is for office use only.
09	Dropped intensified plot – Intensified plot dropped due to a change in grid density. This code used only by units engaged in intensification. This code is for office use only.
10	Other – Entire plot not sampled due to a reason other than one of the specific reasons already listed.
11	Ocean – Plot falls in ocean water below mean high tide line.

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

13. MEASMON Measurement month. The month in which the plot was completed. May be blank (null) for periodic inventory.

Code	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

14. MEASDAY Measurement day. The day of the month in which the plot was completed. May be blank (null) for periodic inventory.

15. REMPER Remeasurement period. The number of years between measurements for remeasured plots. This attribute is null (blank) for new plots or remeasured plots that are not used for growth, removals, or mortality estimates. For data processed with NIMS, REMPER is the number of years between measurements (to the nearest 0.1 year). For data processed with systems other than NIMS, remeasurement period is based on the number of growing seasons between measurements. Allocation of parts of the growing season by month is different for each FIA work unit. Contact the appropriate FIA work unit for information on how this is done for a particular State. **Note**: It is **not** valid to use REMPER to estimate periodic change.

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

Code	Description
0	Periodic inventory plot
1	Initial installation of a National design plot
2	Remeasurement of previously installed National design plot
3	Replacement of previously installed National design plot
4	Modeled periodic inventory plot (Northeastern and North Central only)

17. DESIGNCD Design code. A code indicating the type of plot design used to collect the data. Refer to appendix I for a list of codes and descriptions.

18. RDDISTCD Horizontal distance to road. The straight-line distance from plot center to the nearest improved road, which is a road of any width that is maintained as evidenced by pavement, gravel, grading, ditching, and/or other improvements. Populated for all forested plots using the National Field Guide protocols (MANUAL ≥1.0) and populated by some FIA work units for inventory plots collected where MANUAL <1.0.

Code	Description
1	100 ft or less
2	101 ft to 300 ft
3	301 ft to 500 ft
4	501 ft 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

19. WATERCD Water on plot code. Water body <1 acre in size or a stream <30 feet wide that has the greatest impact on the area within the forest land portion of the four

subplots. The coding hierarchy is listed in order from large permanent water to temporary water. Populated for all forested plots using the National Field Guide protocols (MANUAL ≥1.0) and populated by some FIA work units for inventory plots collected where MANUAL <1.0.

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

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

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

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

23. GROW_TYP_CD

Type of annual volume growth code. A code indicating how volume growth is estimated. Current annual growth is an estimate of the amount of volume that was added to a tree in the year before the tree was sampled, and is based on the measured diameter increment recorded when the tree was sampled or on a modeled diameter for the previous year. Periodic annual growth is an estimate of the average annual change in volume occurring between two measurements, usually the current inventory and the previous inventory, where the same plot is evaluated twice. Periodic annual growth is the increase in volume between inventories divided by the number of years between each

inventory. This attribute is blank (null) if the plot does not contribute to the growth estimate.

Code	Description
1	Current annual
2	Periodic annual

24. MORT_TYP_CD

Type of annual mortality volume code. A code indicating how mortality volume is estimated. Current annual mortality is an estimate of the volume of trees dying in the year before the plot was measured, and is based on the year of death or on a modeled estimate. Periodic annual mortality is an estimate of the average annual volume of trees dying between two measurements, usually the current inventory and previous inventory, where the same plot is evaluated twice. Periodic annual mortality is the loss of volume between inventories divided by the number of years between each inventory. Periodic average annual mortality is the most common type of annual mortality estimated. This attribute is blank (null) if the plot does not contribute to the mortality estimate.

Code	Description
1	Current annual
2	Periodic annual

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

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

27. ECOSUBCD — Ecological subsection code. An area of similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities. Subsection boundaries usually correspond with discrete changes in geomorphology. Subsection information is used for broad planning and assessment. Subsection codes for the coterminous United States were developed as part of the “Forest Service Map of Provinces, Sections, and Subsections of the United States (Cleland and others 2007) (visit http://fsgeodata.fs.fed.us/other_resources/ecosubregions.html). For southeast and south coastal Alaska, the subsection codes are based on the ecological sections as designated in the “Ecoregions and Subregions of Alaska, EcoMap version 2.0” (Nowacki and Brock 1995) (visit

http://agdcftp1.wr.usgs.gov/pub/projects/fhm/ecomap.gif). The ECOSUBCD is based on fuzzed and swapped plot coordinates. This attribute is coded for the coterminous United States, southeast and south coastal Alaska, and is left blank (null) in all other instances.

28. CONGCD — Congressional district code. A territorial division of a State from which a member of the U.S. House of Representatives is elected. The congressional district code assigned to a plot (regardless of when it was measured) is for the current Congress; the assignment is made based on the plot's approximate coordinates. CONGCD is a four-digit number. The first two digits are the State FIPS code and the last two digits are the congressional district number. If a State has only one congressional district, the congressional district number is 00. If a plot's congressional district assignment falls in a State other than the plot's actual State due to using the approximate coordinates, the congressional district code will be for the nearest congressional district in the correct State. This attribute is coded for the coterminous States and Alaska, and is left blank (null) in all other instances. For more information about the coverage used to assign this attribute, see National Atlas of the United States (2007).

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

30. SUBPANEL — Subpanel. Subpanel assignment for the plot for those FIA work units using subpaneling. FIA uses a 5-panel system (see P2PANEL) to divide plot sampling over a 5-year period. Funding for western FIA work units is only sufficient to allow plot sampling over a 10-year period. Therefore, panels are further divided into subpanels. This attribute is left blank (null) if subpaneling is not used. In some States, seven panels are used and SUBPANEL is blank (null).

31. KINDCD_NC — Sample kind code, North Central. This attribute is populated through 2005 for the former North Central work unit (SURVEY.RSCD = 23) and is blank (null) for all other FIA work units.

Code	Description
0	New/lost
6	Remeasured
8	Old location but not remeasured
20	Skipped
33	Replacement of lost plot

32. QA_STATUS Quality assurance status. A code indicating the type of plot data collected. Populated for all forested subplots using the National Field Guide protocols (MANUAL ≥ 1.0).

Code	Description
1	Standard production plot
2	Cold check
3	Reference plot (off grid)
4	Training/practice plot (off grid)
5	Botched plot file (disregard during data processing)
6	Blind check
7	Production plot (hot check)

33. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

34. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

35. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

36. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

37. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

38. MODIFIED_IN _INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

39. MICROPLOT_LOC

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

40. DECLINATION

    Declination. (*Core optional*) 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 work unit historically has corrected all compass readings for true north. This field is to be used only in cases where FIA work units are adjusting azimuths to correspond to true north; for FIA work 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)

41. EMAP_HEX

EMAP hexagon. The identifier for the approximately 160,000 acre Environmental Monitoring and Assessment Program (EMAP) hexagon in which the plot is located. EMAP hexagons are available to the public, cover the coterminous United States, and have been used in summarizing and aggregating data about numerous natural resources. Populated for annual inventory and may be populated for periodic inventory.

42. SAMP_METHOD_CD

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

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

43. SUBP_EXAMINE_CD

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

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

44. MACRO_BREAKPOINT_DIA

Macroplot breakpoint diameter. (*Core optional*) A macroplot breakpoint diameter is the diameter (either DBH or DRC) above which trees are measured on the plot extending from 0.01 to 58.9 feet horizontal distance from the center of each subplot. Examples of different breakpoint diameters used by western FIA work 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. If macroplots are not being installed, this item will be left blank (null).

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

46. CYCLE — Inventory cycle number. See SURVEY.CYCLE description for definition.

47. SUBCYCLE — Inventory subcycle number. See SURVEY.SUBCYCLE description for definition.

48. ECO_UNIT_PNW

Ecological unit, Pacific Northwest Research Station. Plots taken by PNW FIA are assigned to the ecological unit in which they are located. Certain units have stocking adjustments made to the plots that occur on very low productivity lands, which thereby reduces the estimated potential productivity of the plot. More information can be found in MacLean (1973). Only collected by certain FIA work units (SURVEY.RSCD = 26 or 27).

49. TOPO_POSITION_PNW

Topographic position, Pacific Northwest Research Station. The topographic position that describes the plot area. Illustrations available in Plot section of PNW field guide located at: http//www.fs.fed.us/pnw/fia/publications/fieldmanuals.shtml. Adapted from information found in Wilson (1900). Only collected by certain FIA work units (SURVEY.RSCD = 26).

Code	Topographic position	Common shape of slope
1	Ridge top or mountain peak over 130 feet	Flat
2	Narrow ridge top or mountain peak over 130 feet wide	Convex
3	Side hill – upper 1/3	Convex
4	Side hill – middle 1/3	No rounding
5	Side hill – lower 1/3	Concave
6	Canyon bottom less than 660 feet wide	Concave
7	Bench, terrace or dry flat	Flat
8	Broad alluvial flat over 660 feet wide	Flat
9	Swamp or wet flat	Flat

50. EVAL_GRP_CN

    Evaluation group sequence number. Foreign key linking the PLOTSNAP record to a unique POP_EVAL_GRP record.

51. EVAL_GRP Evaluation group. A variable that in conjunction with the STATECD variable uniquely identifies a unique POP_EVAL_GRP record.

52. EXPALL Area expansion factor for all land. The number of acres the sample plot represents for estimating current land area, where the sample includes denied-access and hazardous plots, but excludes outside-of-the-population plots.

53. EXPCURR Area expansion factor for forest land and timberland. The number of acres the sample plot represents for estimating current forest and timberland area, where the sample excludes outside-of-the-population, denied-access, and hazardous plots.

54. EXPVOL Volume expansion factor for forest land and timberland. The number of acres the sample plot represents for estimating current volume, biomass, and number of trees (based on number of sampled plots only).

55. EXPGROW Growth expansion factor for forest land and timberland. The number of acres the sample plot represents for estimating net average annual growth (based on number of sampled plots only).

56. EXPMORT Mortality expansion factor for forest land and timberland. The number of acres the sample plot represents for estimating average annual mortality (based on number of sampled plots only).

57. EXPREMV Removals expansion factor for forest land and timberland. The number of acres the sample plot represents for estimating average annual removals (based on number of sampled plots only).

58. ADJ_EXPALL Adjustment factor for all land area. This adjustment factor should be applied to the CONDPROP_UNADJ on the condition record when generating population estimates to take into account out-of-population portions of conditions within the stratum.

59. ADJ_EXPCURR

    Adjustment factor for forest land and timberland area. This adjustment factor should be applied to the CONDPROP_UNADJ on the condition record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum.

60. ADJ_EXPVOL_MACR

    Macroplot adjustment factor for volume estimation. This adjustment factor should be applied to the TPA_ UNADJ on the tree record when generating

population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the macroplot. Includes trees whose diameters exceed that specified in COND.MACRO_BREAKPOINT_DIA when MACRO_BREAKPOINT_DIA is not null.

61. ADJ_EXPVOL_SUBP

Subplot adjustment factor for volume estimation. This adjustment factor should be applied to the TPA_ UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the subplot.

62. ADJ_EXPVOL_MICR

Microplot adjustment factor for volume estimation. This adjustment factor should be applied to the TPA_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the microplot. Includes trees from 1.00 to 4.99 inches d.b.h.

63. ADJ_EXPGROW_MACR

Macroplot adjustment factor for growth estimation. This adjustment factor should be applied to the TPAGROW_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the macroplot. Includes trees whose diameters exceed that specified in COND.MACRO_BREAKPOINT_DIA when MACRO_BREAKPOINT_DIA is not null.

64. ADJ_EXPGROW_SUBP

Subplot adjustment factor for growth estimation. This adjustment factor should be applied to the TPAGROW_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the subplot.

65. ADJ_EXPGROW_MICR

Microplot adjustment factor for growth estimation. This adjustment factor should be applied to the TPAGROW_UNADJ on the tree record when generating population estimates to take into account out-of-population and

denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the subplot.

66. ADJ_EXPMORT_MACR

Macroplot adjustment factor for mortality estimation. This adjustment factor should be applied to the TPAMORT_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the macroplot. Includes trees whose diameters exceed that specified in COND.MACRO_BREAKPOINT_DIA when MACRO_BREAKPOINT_DIA is not null.

67. ADJ_EXPMORT_SUBP

Subplot adjustment factor for mortality estimation. This adjustment factor should be applied to the TPAMORT_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the subplot.

68. ADJ_EXPMORT_MICR

Microplot adjustment factor for mortality estimation. This adjustment factor should be applied to the TPAMORT_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the microplot. Includes trees from 1.00 to 4.99 inches d.b.h.

69. ADJ_EXPREMV_MACR

Macroplot adjustment factor for removals estimation. This adjustment factor should be applied to the TPAREMV_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the macroplot. Trees whose diameters exceed that specified in COND.MACRO_BREAKPOINT_DIA when MACRO_BREAKPOINT_DIA is not null.

70. ADJ_EXPREMV_SUBP

Subplot adjustment factor for removals estimation. This adjustment factor should be applied to the TPAREMV_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the subplot.

71. ADJ_EXPREMV_MICR

Microplot adjustment factor for removals estimation. This adjustment factor should be applied to the TPAREMV_UNADJ on the tree record when generating population estimates to take into account out-of-population and denied access/hazardous portions of conditions within the stratum. This should be applied only to those trees that were measured on the microplot. Includes trees from 1.00 to 4.99 inches d.b.h.

Reference Population Attribute Table (Oracle table name is REF_POP_ATTRIBUTE)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	ATTRIBUTE_NBR	Attribute number	NUMBER(3)
3	ATTRIBUTE_DESCR	Attribute description	VARCHAR2(255)
4	TIMBERLAND	Timberland	VARCHAR2(1)
5	EVAL_TYP	Evaluation type	VARCHAR2(15)
6	EXPRESSION	Expression	VARCHAR2(4000)
7	WHERE_CLAUSE	Where clause	VARCHAR2(4000)
8	FOOTNOTE	Footnote	VARCHAR2(2000)
9	ATTRIBUTE_GLOSSARY	Attribute glossary	VARCHAR2(4000)
10	CREATED_BY	Created by	VARCHAR2(30)
11	CREATED_DATE	Created date	DATE
12	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
13	MODIFIED_BY	Modified by	VARCHAR2(30)
14	MODIFIED_DATE	Modified date	DATE
15	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PAE_PK
Unique	ATTRIBUTE_NBR	N/A	PAE_UK

1. CN Sequence number. A unique sequence number used to identify a reference population attribute record.

2. ATTRIBUTE_NBR

   Attribute number. A numeric code used to identify an attribute record. See codes and descriptions in chapter 4, table 4.1.

3. ATTRIBUTE_DESCR

   Attribute description. Examples include “Area of forestland (acres)” or “All live biomass on forestland oven-dry (short tons).” See codes and descriptions in chapter 4, table 4.1.

4. TMBERLAND Timberland. A code indicating whether or not the attribute can be computed for a timberland species.

Code	Description
Y	Yes, the attribute can be computed for a timberland species.
N	No, the attribute cannot be computed for a timberland species.

5. EVAL_TYP Evaluation type. Describes the type of evaluation. Evaluation type is needed to generate summary reports for an inventory. For example, a specific evaluation is associated with the evaluation for volume (EXPVOL). At the present time, seven types of evaluations can be produced. See also the REF_POP_EVAL_TYP_DESCR table.

Evaluation type	Evaluation type description
EXPALL	All plots: sampled and nonsampled.
EXPCHNG	Sampled plots used for area change estimates.
EXPCURR	Sampled plots used for current area and condition-level estimates.
EXPDWM	Sampled plots used for down woody material estimates.
EXPGROW	Sampled plots used for tree growth estimates.
EXPMORT	Sampled plots used for tree mortality estimates.
EXPREMV	Sampled plots used for tree removal estimates.
EXPVOL	Sampled plots used for tree inventory estimates.

6. EXPRESSION

   Expression. SQL expression that identifies variables that are used to generate population estimate identified by ATTRIBUTE_DESCR (chapter 4, table 4.2). **Note**: when EXPRESSION contains “z_user”, “z_user” is a placeholder for the table owner name.

7. WHERE_CLAUSE

   Where clause. SQL where clause that identifies the appropriate method for joining tables and screening records to generate population estimate identified by REF_POP_ATTRIBUTE.ATTRIBUTE_DESCR (chapter 4, table 4.2).

8. FOOTNOTE Footnote. Contains the footnote to be used in reports summarizing the attribute.

9. ATTRIBUTE_GLOSSARY

   Attribute glossary. Description of the attribute.

10. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

11. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

12. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

13. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

14. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

15. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Population Evaluation Type Description Table (Oracle table name is REF_POP_EVAL_TYP_DESCR)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	LABEL_ORDER	Label order	NUMBER(2)
3	EVAL_TYP	Evaluation type	VARCHAR2(15)
4	EVAL_TYP_LABEL	Evaluation type label	VARCHAR2(15)
5	CHANGE_EVAL_TYPE	Change evaluation type	VARCHAR2(1)
6	EVAL_TYP_DESCR	Evaluation type description	VARCHAR2(255)
7	CREATED_BY	Created by	VARCHAR2(30)
8	CREATED_DATE	Created date	DATE
9	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
10	MODIFIED_BY	Modified by	VARCHAR2(30)
11	MODIFIED_DATE	Modified date	DATE
12	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	PED_PK
Unique	EVAL_TYP	N/A	PED_UK

1. CN Sequence number. A unique sequence number used to identify a reference population evaluation type description record.

2. LABEL_ORDER

   Label order. The order in which to assemble EVAL_TYP to create standardized evaluation group descriptions.

3. EVAL_TYP Evaluation type. Evaluation types (EVAL_TYP) and the description of the evaluation types (EVAL_TYP_DESCR) are:

Evaluation type	Evaluation type description
EXPALL	All plots: sampled and nonsampled.
EXPCHNG	Sampled plots used for area change estimates.
EXPCURR	Sampled plots used for current area and condition-level estimates.
EXPDWM	Sampled plots used for down woody material estimates.
EXPGROW	Sampled plots used for tree growth estimates.
EXPMORT	Sampled plots used for tree mortality estimates.
EXPREMV	Sampled plots used for tree removal estimates.
EXPVOL	Sampled plots used for tree inventory estimates.

4. EVAL_TYP_LABEL

   Evaluation type label. The label used for the EVAL_TYP description.

5. CHANGE_EVAL_TYPE

   Change evaluation type. A code indicating whether the EVAL_TYP computes change attributes, such as growth, removals, and mortality.

Code	Description
Y	Yes, computes change attributes.
N	No, does not compute change attributes.

6. EVAL_TYP_DESCR

   Evaluation type description. The description for each evaluation type (EVAL_TYP). See the list of codes and descriptions in EVAL_TYP.

7. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

8. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

9. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

10. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

11. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

12. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Forest Type Table (Oracle table name is REF_FOREST_TYPE)

	Column name	Descriptive name	Oracle data type
1	VALUE	Value	NUMBER(3)
2	MEANING	Meaning	VARCHAR2(80)
3	TYPGRPCD	Forest type group code	NUMBER(3)
4	MANUAL_START	Manual start	NUMBER(3,1)
5	MANUAL_END	Manual end	NUMBER(3,1)
6	ALLOWED_IN_FIELD	Allowed in field	VARCHAR2(1)
7	CREATED_BY	Created by	VARCHAR2(30)
8	CREATED_DATE	Created date	DATE
9	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
10	MODIFIED_BY	Modified by	VARCHAR2(30)
11	MODIFIED_DATE	Modified date	DATE
12	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	VALUE	N/A	RFT_PK

1. VALUE — Value. A code used for the forest type (COND.FORTYPCD, COND.FLDTYPCD, COND.FORTYPCDCALC). Refer to appendix D.

2. MEANING — Meaning. The descriptive name corresponding with the forest type code (VALUE). The names associated with these codes are used to label rows or columns in National standard presentation tables. Refer to appendix D.

3. TYPGRPCD — Forest type group code. A code assigned to individual forest types in order to group them for reporting purposes. Refer to appendix D.

4. MANUAL_START

   Manual start. The first version of the Field Guide (PLOT.MANUAL) that the forest type code (VALUE) began to be used.

5. MANUAL_END

   Manual end. The last version of the Field Guide (PLOT.MANUAL) that the forest type code (VALUE) was valid. When MANUAL_END is blank (null), the code is still valid.

6. ALLOWED_IN_FIELD

   Allowed in field. An indicator to show if a code (VALUE) is allowed to be used by the field crews. This is a Yes/No (Y/N) field. Specifically, forest type group codes are not allowed in the Field Guide nor is the code for a nonstocked forest type (VALUE = 999).

7 CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

8. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

9. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

10. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

11. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

12. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Forest Type Group Table (Oracle table name is REF_FOREST_TYPE_GROUP)

	Column name	Descriptive name	Oracle data type
1	VALUE	Value	NUMBER(3)
2	MEANING	Meaning	VARCHAR2(80)
3	ABBR	Abbreviation	VARCHAR2(40)
4	DUFF_DENSITY	Duff density	NUMBER(12,10)
5	DUFF_CARBON_RATIO	Duff carbon ratio	NUMBER(12,11)
6	LITTER_DENSITY	Litter density	NUMBER(12,10)
7	LITTER_CARBON_RATIO	Litter carbon ratio	NUMBER(12,11)
8	PILE_DENSITY	Pile density	NUMBER(12,10)
9	PILE_CARBON_RATIO	Pile carbon ratio	NUMBER(12,11)
10	PILE_DECAY_RATIO	Pile decay ratio	NUMBER(12,11)
11	FWD_DENSITY	Fine woody debris density	NUMBER(12,10)
12	FWD_CARBON_RATIO	Fine woody debris carbon ratio	NUMBER(12,11)
13	FWD_DECAY_RATIO	Fine woody debris decay ratio	NUMBER(12,11)
14	FWD_SMALL_QMD	Small fine woody debris quadratic mean diameter	NUMBER(12,10)
15	FWD_MEDIUM_QMD	Medium fine woody debris quadratic mean diameter	NUMBER(12,10)
16	FWD_LARGE_QMD	Large fine woody debris quadratic mean diameter	NUMBER(12,10)
17	CREATED_BY	Created by	VARCHAR2(30)
18	CREATED_DATE	Created date	DATE
19	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
20	MODIFIED_BY	Modified by	VARCHAR2(30)
21	MODIFIED_DATE	Modified date	DATE
22	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	VALUE	N/A	FTGP_PK

1. VALUE Value. A code used for the forest type group, which is assigned to individual forest types (COND.FORTYPCD, COND.FLDTYPCD, COND.FORTYPCDCALC) for reporting purposes. VALUE is linked to the TYPGRPCD in the REF_FOREST_TYPE table. Refer to appendix D.

2. MEANING Meaning. The descriptive name corresponding with the forest type group code (VALUE). The names associated with these codes are used to label rows or columns in National standard presentation tables. Refer to appendix D.

3. ABBR Abbreviation. The Forest type group abbreviation.

4. DUFF_DENSITY

   Duff density. The average oven dry density of duff in pounds per cubic foot.

5. DUFF_CARBON_RATIO

   Duff carbon ratio. The ratio of carbon weight to biomass of duff.

6. LITTER_DENSITY

   Litter density. The average oven dry density of litter in pounds per cubic foot.

7. LITTER_CARBON_RATIO

   Litter carbon ratio. The ratio of carbon weight to biomass of litter.

8. PILE_DENSITY

   Pile density. The average oven dry density of piles in pounds per cubic foot.

9. PILE_CARBON_RATIO

   Pile carbon ratio. The ratio of carbon weight to biomass of piles.

10. PILE_DECAY_RATIO

    Pile decay ratio. The ratio of decayed to sound wood weight of piles.

11. FWD_DENSITY

    Fine woody debris density. The average oven dry density of fine woody debris in pounds per cubic foot.

12. FWD_CARBON_RATIO

    Fine woody debris carbon ratio. The ratio of carbon weight to biomass of fine woody debris.

13. FWD_DECAY_RATIO

    Fine woody debris decay ratio. The ratio of decayed to sound wood weight of fine woody debris.

14. FWD_SMALL_QMD

    Small fine woody debris quadratic mean diameter. The quadratic mean diameter of small fine woody debris.

15. FWD_MEDIUM_QMD

    Medium fine woody debris quadratic mean diameter. The quadratic mean diameter of medium fine woody debris.

16. FWD_LARGE_QMD

    Large fine woody debris quadratic mean diameter. The quadratic mean diameter of large fine woody debris.

17. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

18. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

19. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

20. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

21. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

22. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Species Table (Oracle table name is REF_SPECIES)

	Column name	Descriptive name	Oracle data type
1	SPCD	Species code	NUMBER
2	COMMON_NAME	Common name of species	VARCHAR2(100)
3	GENUS	Genus	VARCHAR2(40)
4	SPECIES	Species name	VARCHAR2(50)
5	VARIETY	Variety	VARCHAR2(50)
6	SUBSPECIES	Subspecies name	VARCHAR2(50)
7	SPECIES_SYMBOL	Species symbol	VARCHAR2(8)
8	E_SPGRPCD	East species group code	NUMBER(2)
9	W_SPGRPCD	West species group code	NUMBER(2)
10	C_SPGRPCD	Caribbean species group code	NUMBER(2)
11	P_SPGRPCD	Pacific species group code	NUMBER(2)
12	MAJOR_SPGRPCD	Major species group code	NUMBER(1)
13	STOCKING_SPGRPCD	Stocking species group code	NUMBER(3)
14	FOREST_TYPE_SPGRPCD	Forest type species group code	NUMBER(3)
15	EXISTS_IN_NCRS	Exists in the North Central Research Station States	VARCHAR2(1)
16	EXISTS_IN_NERS	Exists in the Northeastern Research Station States	VARCHAR2(1)
17	EXISTS_IN_PNWRS	Exists in the Pacific Northwest Research Station States	VARCHAR2(1)
18	EXISTS_IN_RMRS	Exists in the Rocky Mountain Research Station States	VARCHAR2(1)
19	EXISTS_IN_SRS	Exists in the Southern Research Station States	VARCHAR2(1)
20	SITETREE	Site tree	VARCHAR2(1)
21	SFTWD_HRDWD	Softwood or hardwood	VARCHAR2(1)
22	ST_EXISTS_IN_NCRS	Site tree exists in the North Central Research Station region	VARCHAR2(1)
23	ST_EXISTS_IN_NERS	Site tree exists in the Northeastern Research Station region	VARCHAR2(1)
24	ST_EXISTS_IN_PNWRS	Site tree exists in the Pacific Northwest Research Station region	VARCHAR2(1)
25	ST_EXISTS_IN_RMRS	Site tree exists in the Rocky Mountain Research Station region	VARCHAR2(1)
26	ST_EXISTS_IN_SRS	Site tree exists in the Southern Research Station region	VARCHAR2(1)
27	CORE	Core	VARCHAR2(1)
28	EAST	East	VARCHAR2(1)
29	WEST	West	VARCHAR2(1)
30	CARIBBEAN	Caribbean species	VARCHAR2(1)
31	PACIFIC	Pacific species	VARCHAR2(1)
32	WOODLAND	Woodland species	VARCHAR2(1)
33	MANUAL_START	Manual start	NUMBER(3,1)
34	MANUAL_END	Manual end	NUMBER(3,1)

	Column name	Descriptive name	Oracle data type
35	JENKINS_SPGRPCD	Jenkins species group code	NUMBER(2)
36	JENKINS_TOTAL_B1	Jenkins total B1	NUMBER(8,5)
37	JENKINS_TOTAL_B2	Jenkins total B2	NUMBER(8,5)
38	JENKINS_STEM_WOOD_RATIO_B1	Jenkins stem wood ratio B1	NUMBER(8,5)
39	JENKINS_STEM_WOOD_RATIO_B2	Jenkins stem wood ratio B2	NUMBER(8,5)
40	JENKINS_STEM_BARK_RATIO_B1	Jenkins stem bark ratio B1	NUMBER(8,5)
41	JENKINS_STEM_BARK_RATIO_B2	Jenkins stem bark ratio B2	NUMBER(8,5)
42	JENKINS_FOLIAGE_RATIO_B1	Jenkins foliage ratio B1	NUMBER(8,5)
43	JENKINS_FOLIAGE_RATIO_B2	Jenkins foliage ratio B2	NUMBER(8,5)
44	JENKINS_ROOT_RATIO_B1	Jenkins root ratio B1	NUMBER(8,5)
45	JENKINS_ROOT_RATIO_B2	Jenkins root ratio B2	NUMBER(8,5)
46	JENKINS_SAPLING_ADJUSTMENT	Jenkins sapling adjustment factor	NUMBER(8,5)
47	WOOD_SPGR_GREENVOL_DRYWT	Green specific gravity wood (green volume and oven-dry weight)	NUMBER(8,5)
48	WOOD_SPGR_GREENVOL_DRYWT_CIT	Green specific gravity wood citation	NUMBER(7)
49	BARK_SPGR_GREENVOL_DRYWT	Green specific gravity bark (green volume and oven-dry weight)	NUMBER(8,5)
50	BARK_SPGR_GREENVOL_DRYWT_CIT	Green specific gravity bark citation	NUMBER(7)
51	MC_PCT_GREEN_BARK	Moisture content of green bark as a percent of oven-dry weight	NUMBER(8,5)
52	MC_PCT_GREEN_BARK_CIT	Moisture content of green bark citation	NUMBER(7)
53	MC_PCT_GREEN_WOOD	Moisture content of green wood as a percent of oven-dry weight	NUMBER(8,5)
54	MC_PCT_GREEN_WOOD_CIT	Moisture content of green wood citation	NUMBER(7)
55	WOOD_SPGR_MC12VOL_DRYWT	Wood specific gravity (12 percent moisture content volume and oven-dry weight)	NUMBER(8,5)
56	WOOD_SPGR_MC12VOL_DRYWT_CIT	Wood specific gravity (12 percent moisture content volume and oven-dry weight) citation	NUMBER(7)
57	BARK_VOL_PCT	Bark volume as a percent of wood volume	NUMBER(8,5)
58	BARK_VOL_PCT_CIT	Bark volume as a percent of wood volume citation	NUMBER(7)
59	RAILE_STUMP_DOB_B1	Raile stump diameter outside bark equation coefficient B1	NUMBER(8,5)
60	RAILE_STUMP_DIB_B1	Raile stump diameter inside bark equation coefficient B1	NUMBER(8,5)
61	RAILE_STUMP_DIB_B2	Raile stump diameter inside bark equation coefficient B2	NUMBER(8,5)
62	CWD_DECAY_RATIO1	Coarse woody debris decay ratio 1	NUMBER(6,5)
63	CWD_DECAY_RATIO2	Coarse woody debris decay ratio 2	NUMBER(6,5)
64	CWD_DECAY_RATIO3	Coarse woody debris decay ratio 3	NUMBER(6,5)

	Column name	Descriptive name	Oracle data type
65	CWD_DECAY_RATIO4	Coarse woody debris decay ratio 4	NUMBER(6,5)
66	CWD_DECAY_RATIO5	Coarse woody debris decay ratio 5	NUMBER(6,5)
67	DWM_CARBON_RATIO	Down woody debris carbon ratio	NUMBER(6,5)
68	STANDING_DEAD_DECAY_RATIO 1	Standing dead decay ratio 1	NUMBER(6,5)
69	STANDING_DEAD_DECAY_RATIO 2	Standing dead decay ratio 2	NUMBER(6,5)
70	STANDING_DEAD_DECAY_RATIO 3	Standing dead decay ratio 3	NUMBER(6,5)
71	STANDING_DEAD_DECAY_RATIO 4	Standing dead decay ratio 4	NUMBER(6,5)
72	STANDING_DEAD_DECAY_RATIO 5	Standing dead decay ratio 5	NUMBER(6,5)
73	CREATED_BY	Created by	VARCHAR2(30)
74	CREATED_DATE	Created date	DATE
75	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
76	MODIFIED_BY	Modified by	VARCHAR2(30)
77	MODIFIED_DATE	Modified date	DATE
78	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	SPCD	N/A	SPC_PK
Unique	SPECIES_SYMBOL	N/A	SPC_UK
Foreign	E_SPGRPCD	REF_SPECIES to REF_SPECIES_GROUP	SPC_SGP_FK1
Foreign	W_SPGRPCD	REF_SPECIES to REF_SPECIES_GROUP	SPC_SGP_FK2
Foreign	C_SPGRPCD	REF_SPECIES to REF_SPECIES_GROUP	SPC_SGP_FK3
Foreign	P_SPGRPCD	REF_SPECIES to REF_SPECIES_GROUP	SPC_SGP_FK4

Coefficients for calculating total aboveground biomass based on Jenkins and others (2003) equations are included in the REF_SPECIES table. Coefficients for calculating biomass components (stem wood, stem bark, foliage, coarse roots, stump, and sapling) are also included in the REF_SPECIES table. Biomass in branches and treetops (tops and limbs) may be found by subtracting the biomass in stem wood, stem bark, foliage, and stump from total aboveground biomass. Heath and others (2009) provides an overview of the historical use of Jenkins and others (2003) for biomass estimation for the U.S. forest greenhouse gas inventory (U.S. Environmental Protection Agency 2008) and an overview of the approach of the new biomass equations used for FIA data.

1. SPCD Species code. An FIA tree species code. Refer to appendix F for codes.

2. COMMON_NAME

   Common name. Common name of the species. Refer to appendix F.

3. GENUS Genus. The genus name associated with the FIA tree species code. Refer to appendix F.

4. SPECIES Species. The species name associated with the FIA tree species code. Refer to appendix F.

5. VARIETY Variety. The variety name associated with the FIA tree species code.

6. SUBSPECIES Subspecies. The subspecies name associated with the FIA tree species code.

7. SPECIES_SYMBOL

   Species symbol. The NRCS PLANTS database code associated with the FIA tree species code.

8. E_SPGRPCD Eastern species group code. A code indicating the species group assignment for eastern species. Depending on the State in which a tree is tallied, the eastern, western, Caribbean, or pacific species group code is associated with the actual TREE, SITETREE, and SEEDLING data. Species group codes and names can be found in appendix E.

9. W_SPGRPCD Western species group code. A code indicating the FIADB species group assignment for western species. Depending on the State in which a tree is tallied, the eastern, western, Caribbean, or pacific species group code is associated with the actual TREE, SITETREE, and SEEDLING data. Species group codes and names can be found in appendix E.

10. C_SPGRPCD Caribbean species group code. A code indicating the species group assignment for Caribbean species. Depending on the State in which a tree is tallied, the eastern, western, Caribbean, or pacific species group code is associated with the actual TREE, SITETREE, and SEEDLING data. Species group codes and names can be found in appendix E.

11. P_SPGRPCD Pacific species group code. A code indicating the species group assignment for pacific species. Depending on the State in which a tree is tallied, the eastern, western, Caribbean, or pacific species group code is associated with the actual TREE, SITETREE, and SEEDLING data. Species group codes and names can be found in appendix E.

12. MAJOR_SPGRPCD

Major species group code. A code indicating the major species group, which can be used for reporting purposes.

Code	Description
1	Pine
2	Other conifers
3	Soft hardwood
4	Hard hardwood

13. STOCKING_SPGRPCD

Stocking species group code. A code indicating which stocking equation a species is assigned.

Code	Description
1	Spruce-fir
2	Western larch
3	Black spruce
4	Jack pine
5	Lodgepole pine
6	Shortleaf pine
7	Slash pine
8	Western white pine
9	Longleaf pine
10	Ponderosa pine
11	Red pine
12	Pond pine
13	Eastern white pine
14	Loblolly pine
15	Douglas-fir
16	Northern white cedar
17	Eastern hemlock
18	Western hemlock
19	Redwood
20	Average softwood
25	Red maple
26	Red alder
27	Maple, beech, birch
28	Paper birch
29	Oaks and hickory
30	Black walnut
31	Sweetgum
32	Aspen
33	Cherry, ash, yellow poplar
35	Basswood
36	Elm, ash, cottonwood
37	Average hardwood
38	Dryland species

14.FOREST_TYPE_SPGRPCD

Forest type species group code. A code indicating which initial forest type group a species is assigned.

15. EXISTS_IN_NCRS

Exists in the North Central Research Station. Indicates which species are valid for North Central Research Station States. Trees that are applicable to North Central States are marked with an X.

16. EXISTS_IN_NERS

Exists in the Northeastern Research Station. Indicates which tree species are valid for Northeastern Research Station States. Tree species that are applicable to Northeastern States are marked with an X.

17. EXISTS_IN_PNWRS

Exists in the Pacific Northwest Research Station. Indicates which species are valid for Pacific Northwest Research Station States. Tree species that are applicable to Pacific Northwest States are marked with an X.

18. EXISTS_IN RMRS

Exists in the Rocky Mountain Research Station. Indicates which species are valid for Rocky Mountain Research Station States. Tree species that are applicable to the Rocky Mountain States are marked with an X.

19. EXISTS_IN_SRS

Exists in the Southern Research Station States. Indicates which species are valid for Southern Research Station States. Tree species that are applicable to the Southern States are marked with an X.

20. SITETREE Sitetree. Indicates whether the tree species can be coded as a site tree. Tree species that are applicable to have site data collected are marked with an X.

21. SFTWD_HRDWD

Softwood/ hardwood. Indicates whether the species is a softwood or a hardwood. Softwoods are marked with an S and hardwoods with an H.

22. ST_EXISTS_IN_NCRS

Site tree exists in the North Central Research Station. Indicates whether or not the species is valid as a site tree in North Central Research Station States. Tree species that are applicable to have site data collected are marked with an X.

23. ST_EXISTS_IN_NERS

    Site tree exists in the Northeastern Research Station. Indicates whether or not the species is valid as a site tree in Northeastern Research Station States. Tree species that are applicable to have site data collected are marked with an X.

24. ST_EXISTS_IN_PNWRS

    Site tree exists in the Pacific Northwest Research Station. Indicates whether or not the species is valid for a site tree in Pacific Northwest Research Station States. Tree species that are applicable to have site data collected are marked with an X.

25. ST_EXISTS_IN RMRS

    Site tree exists in the Rocky Mountain Research Station. Indicates whether or not the species is valid as a site tree in Rocky Mountain Research Station States. Tree species that are applicable to have site data collected are marked with an X.

26. ST_EXISTS_IN_SRS

    Site tree exists in the Southern Research Station. Indicates whether or not the species is valid for a site tree in Southern Research Station States. Tree species that are applicable to have site data collected are marked with an X.

27. CORE — Core. Indicates that the tree species must be tallied (measured) by all FIA work units. Species marked with a Y are core and core optional species are marked with an N.

28. EAST — East. Indicates if the species can occur in the Eastern United States. Valid eastern species are marked with an E.

29. WEST — West. Indicates if the species can occur in the Western United States. Valid western species are marked with a W.

30. CARIBBEAN — Caribbean. Indicates if the species can occur in the Caribbean. Valid Caribbean species are marked with a C.

31. PACIFIC — Pacific. Indicates if the species can occur in the pacific area. Valid pacific species are marked with a P.

32. WOODLAND — Woodland. Indicates if the species is classified as a woodland species, meaning that the diameter is measured as root collar. Woodland species are marked with an X.

33. MANUAL_START

Manual start. The first version of the Field Guide (PLOT.MANUAL) that the species code was used.

34. MANUAL_END

Manual end. The last version of the Field Guide (PLOT. MANUAL) that the species code was valid. When MANUAL_END is blank (null), the code is still valid.

35. JENKINS_SPGRPCD

Jenkins species group code. A code that identifies a group of similar species, which is used to apply the correct biomass estimation equation and coefficient developed by Jenkins and others (2003). A specific set of biomass equation coefficients are assigned to each group. Additional explanation about how to estimate biomass, and when to use a certain set of coefficients, is provided in appendix M.

Code	Description
1	Cedar/larch
2	Douglas-fir
3	True fir/hemlock
4	Pine
5	Spruce
6	Aspen/alder/cottonwood-willow
7	Soft maple/birch
8	Mixed hardwood
9	Hard maple/oak/hickory/beech
10	Juniper/oak/mesquite

36. JENKINS_TOTAL_B1

Jenkins total B1. Jenkins B1 coefficient used to estimate total aboveground oven-dry biomass (pounds). This is coefficient B_0 from table 4 in Jenkins and others (2003). See appendix M for details on biomass equations.

Use JENKINS_TOTAL_B1 along with JENKINS_TOTAL_B2 to estimate total aboveground biomass (includes stem wood (bole), stump, bark, top, limbs, and foliage) with the equation below:

Total_agb = (Exp(JENKINS_TOTAL_B1 + JENKINS_TOTAL_B2 * ln(DIA*2.54)) * 2.2046)

JENKINS_SPGRPCD	JENKINS_TOTAL_B1
1	-2.03360
2	-2.23040
3	-2.53840
4	-2.53560

JENKINS_SPGRPCD	JENKINS_TOTAL_B1
5	-2.07730
6	-2.20940
7	-1.91230
8	-2.48000
9	-2.01270
10	-0.71520

37. JENKINS_TOTAL_B2

Jenkins total B2. Jenkins B2 coefficient used to estimate total aboveground oven-dry biomass (pounds). This is coefficient B_1 from table 4 in Jenkins and others (2003). See appendix M for details on biomass equations.

Use JENKINS_TOTAL_B2 along with JENKINS_TOTAL_B1 to estimate total aboveground biomass (includes stem wood (bole), stump, bark, top, limbs, and foliage) with the equation below:

Total_agb = (Exp(JENKINS_TOTAL_B1 + JENKINS_TOTAL_B2 * ln(DIA*2.54)) * 2.2046)

JENKINS_SPGRPCD	JENKINS_TOTAL_B2
1	2.25920
2	2.44350
3	2.48140
4	2.43490
5	2.33230
6	2.38670
7	2.36510
8	2.48350
9	2.43420
10	1.70290

38. JENKINS_STEM_WOOD_RATIO_B1

Jenkins stem wood ratio B1. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_0 for stem wood from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). The stem is defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix M for details on biomass equations.

The average proportion of aboveground biomass in stem wood is calculated using this equation:

stem_ratio = Exp(JENKINS_STEM_WOOD_RATIO_B1 + JENKINS_STEM_WOOD_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_STEM_WOOD_RATIO_B1
Softwood (S)	-0.3737
Hardwood (H)	-0.3065

39. JENKINS_STEM_WOOD_RATIO_B2

Jenkins stem wood ratio B2. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_1 for stem wood from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). The stem is defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix M for details on biomass equations.

The average proportion of aboveground biomass in stem wood is calculated using this equation:

stem_ratio = Exp(JENKINS_STEM_WOOD_RATIO_B1 + JENKINS_STEM_WOOD_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_STEM_WOOD_RATIO_B2
Softwood (S)	-1.8055
Hardwood (H)	-5.4240

40. JENKINS_STEM_BARK_RATIO_B1

Jenkins stem bark ratio B1. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_0 for stem bark from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). This ratio estimates bark biomass on the stem, defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix M for details on biomass equations.

The average proportion of aboveground biomass in stem bark is calculated using this equation:

bark_ratio = Exp(JENKINS_STEM_BARK_RATIO_B1 + JENKINS_STEM_BARK_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_STEM_BARK_RATIO_B1
Softwood (S)	-2.0980
Hardwood (H)	-2.0129

41. JENKINS_STEM_BARK_RATIO_B2

Jenkins stem bark ratio B2. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_1 for stem bark from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the

species category (SFTWD_HRDWD). This ratio estimates bark biomass on the stem, defined as that portion of the tree from a 1-foot stump to a 4-inch DOB top (i.e., the merchantable bole.) See appendix M for details on biomass equations.

The average proportion of aboveground biomass in stem bark is calculated using this equation:

bark_ratio = Exp(JENKINS_STEM_BARK_RATIO_B1 + JENKINS_STEM_BARK_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_STEM_BARK_RATIO_B2
Softwood (S)	-1.1432
Hardwood (H)	-1.6805

42. JENKINS_FOLIAGE_RATIO_B1

Jenkins foliage ratio B1. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_0 for foliage from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). See appendix M for details on biomass equations.

The average proportion of aboveground biomass in foliage is calculated using this equation:

foliage_ratio = Exp(JENKINS_FOLIAGE_RATIO_B1 + JENKINS_FOLIAGE_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_FOLIAGE_RATIO_B1
Softwood (S)	-2.9584
Hardwood (H)	-4.0813

43. JENKINS_FOLIAGE_RATIO_B2

Jenkins foliage ratio B2. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_1 for foliage from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). See appendix M for details on biomass equations.

The average proportion of aboveground biomass in foliage is calculated using this equation:

foliage_ratio = Exp(JENKINS_FOLIAGE_RATIO_B1 + JENKINS_FOLIAGE_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_FOLIAGE_RATIO_B2
Softwood (S)	4.4766
Hardwood (H)	5.8816

44. JENKINS_ROOT_RATIO_B1

Jenkins root ratio B1. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_0 for coarse roots from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). See appendix M for details on biomass equations.

The average proportion of coarse roots to total aboveground biomass is calculated using this equation:

root_ratio = Exp(JENKINS_ROOT_RATIO_B1 + JENKINS_ROOT_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_ROOT_RATIO_B1
Softwood (S)	-1.5619
Hardwood (H)	-1.6911

45. JENKINS_ROOT_RATIO_B2

Jenkins root ratio B2. A coefficient used in computing component ratio biomass. This is equivalent to coefficient B_1 for coarse roots from table 6 in Jenkins and others (2003). The appropriate coefficient to use is based on the species category (SFTWD_HRDWD). See appendix M for details on biomass equations.

The average proportion of coarse roots to total aboveground biomass is calculated using this equation:

root_ratio = Exp(JENKINS_ROOT_RATIO_B1 + JENKINS_ROOT_RATIO_B2 / (DIA*2.54))

Species category	JENKINS_ROOT_RATIO_B2
Softwood (S)	0.6614
Hardwood (H)	0.8160

46. JENKINS_SAPLING_ADJUSTMENT

Jenkins sapling adjustment factor. A factor used to compute the biomass of saplings. Sapling biomass is computed by multiplying diameter (DIA) by the appropriate species adjustment factor (from Jenkins and others [2003]). The sapling adjustment factor was computed as a national average ratio of the DRYBIOT (total dry biomass) divided by the Jenkins total biomass for all 5.0-inch trees, which is the size at which biomass based on volume begins. Because this adjustment factor was computed at the species level, there is a specific adjustment factor for each species. Users can download the REF_SPECIES table, which includes the values of JENKINS_SAPLING_ADJUSTMENT at http://ncrs2.fs.fed.us/fiadb4-downloads/datamart.html. See appendix M for details on biomass equations.

47. WOOD_SPGR_GREENVOL_DRYWT

Green specific gravity of wood (green volume and oven-dry weight). This variable is used to determine the oven-dry weight (in pounds) of live and dead trees based on volume variables in the TREE table (VOLCFSND, VOLCFGRS, VOLCFNET…). These volumes are assumed to be green wood volumes. Oven-dry biomass for the sound volume in a tree can be calculated using this equation:

B_{odw} = VOLCFSND x WOOD_SPGR_GREENVOL_DRYWT x 62.4

Where:

B_{odw} = sound oven-dry biomass of a tree in pounds

VOLCFSND = sound volume of a tree in cubic feet

48. WOOD_SPGR_GREENVOL_DRYWT_CIT

Citation for WOOD_SPGR_GREENVOL_DRYWT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the WOOD_SPGR_GREENVOL_DRYWT variable.

49. BARK_SPGR_GREENVOL_DRYWT

Green specific gravity of the bark (green volume and oven-dry weight). There is some shrinkage in bark volume when a live tree is cut and dried. In FIADB, this specific gravity is used on live and dead trees to convert green volume to oven-dry weight in pounds. Oven-dry biomass for bark can be calculated using the volume of a tree using this equation:

B_{odw} = BARK_VOLUME x BARK_SPGR_GREENVOL_DRYWT x 62.4

Where:

B_{odw} = oven-dry biomass of bark on a tree in pounds

BARK_VOLUME = volume of the bark on a tree bole, in cubic feet. Note that bark volume is often estimated by subtracting volume of the bole inside bark from volume of the bole outside bark. Or, an estimate of bark volume can be obtained using any tree volume column along with BARK_VOL_PCT found in this table as follows:

BARK_VOLUME = TREE_VOLUME * (BARK_VOL_PCT/100.0)

50. BARK_SPGR_GREENVOL_DRYWT_CIT

Citation for BARK_SPGR_GREENVOL_DRYWT. The value of this variable can be linked to the corresponding value in the CITATION_NBR

variable in the REF_CITATION table to find the source of the BARK_SPGR_GREENVOL_DRYWT variable.

51. MC_PCT_GREEN_BARK

Moisture content of green bark as a percent of oven-dry weight. Wood and bark are often sold based on green weight. The user is cautioned that green weights can be extremely variable geographically, seasonally, within species and across various portions of individual trees. To estimate the biomass of green bark, use the following formula for each biomass component:

Biomass in pounds = ((1.0 + MC_PCT_GREEN_BARK/100) *
(1.0 - (BARK_VOL_PCT / (100 + BARK_VOL_PCT)) *
BARK_SPGR_GREENVOL_DRYWT)) *
[a biomass component : DRYBIO_BOLE, DRYBIO_TOP,
DRYBIO_STUMP, DRYBIO_SAPLING, or DRYBIO_WDLD_SPP]

Note that the biomass must be multiplied by TPA_UNADJ and the appropriate adjustment factor to develop a per-acre estimate.

52. MC_PCT_GREEN_BARK_CIT

Citation for MC_PCT_GREEN_BARK. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the MC_PCT_GREEN_BARK variable.

53. MC_PCT_GREEN_WOOD

Moisture content of green wood as a percent of oven-dry weight. Wood and bark are often sold based on green weight. The user is cautioned that green weights can be extremely variable geographically, seasonally, within species and across various portions of individual trees. To estimate the biomass of green wood, use the following formula for each biomass component:

Biomass (per tree) in pounds =
((1+[MC_PCT_GREEN_WOOD]/100)*([BARK_VOL_PCT]/
(100+[BARK_VOL_PCT])*[WOOD_SPGR_GREENVOL_DRYWT])) *
[a biomass component: DRYBIO_BOLE, DRYBIO_TOP,
DRYBIO_STUMP, DRYBIO_SAPLING, or DRYBIO_WDLD_SPP]

Note that the biomass must be multiplied by TPA_UNADJ and the appropriate adjustment factor to develop a per-acre estimate.

54. MC_PCT_GREEN_WOOD_CIT

Citation for MC_PCT_GREEN_WOOD_CIT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the

REF_CITATION table to find the source of the MC_PT_GREEN_WOOD variable.

55. WOOD_SPGR_MC12VOL_DRYWT

Wood specific gravity (12 percent moisture content volume and oven-dry weight). Used in biomass estimation of forest products (lumber, veneer, etc.).

56. WOOD_SPGR_MC12VOL_DRYWT_CIT

Citation for WOOD_SPGR_MC12VOL_DRYWT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the WOOD_SPGR_MC12VOL_DRYWT variable.

57. BARK_VOL_PCT

Bark volume as a percent of wood volume. Bark volume expressed as a percent of wood volume. The volume of bark does not include voids due to ridges and valleys in bark.

58. BARK_VOL_PCT_CIT

Citation for BARK_VOL_PCT. The value of this variable can be linked to the corresponding value in the CITATION_NBR variable in the REF_CITATION table to find the source of the BARK_VOL_PCT variable.

59. RAILE_STUMP_DOB_B1

Raile stump diameter outside bark equation coefficient B1. This is equivalent to coefficient B from table 1 in Raile (1982). See appendix M for details on biomass equations.

This coefficient is used in an equation to estimate diameter outside bark at any point on the stump from ground to 1 foot high. From this, volume outside bark is estimated for the selected height along the stump. Volume inside bark is subtracted from volume outside bark to estimate bark volume. Both volumes are converted to biomass using either wood or bark specific gravities. (DOB and DIA are in inches, HT is in feet.)

DOB = DIA + (DIA * RAILE_STUMP_DOB_B1 * (4.5-HT) / (HT+1))

60. RAILE_STUMP_DIB_B1

Raile stump diameter inside bark equation coefficient B1. This is equivalent to coefficient A from table 2 in Raile (1982). See appendix M for details on biomass equations.

This coefficient is used along with RAILE_STUMP_DIB_B2 in an equation to estimate diameter inside bark at any point on the stump from ground to 1 foot high. From this, volume inside bark is estimated for the selected height along the stump. Volume inside bark is subtracted from volume outside bark to estimate bark volume. Both volumes are converted to biomass using either wood or bark specific gravities. (DIB and DIA are in inches, HT is in feet.)

DIB = (DIA * RAILE_STUMP_DIB_B1) +

(DIA * RAILE_STUMP_DIB_B2 * (4.5-HT) / (HT+1))

61. RAILE_STUMP_DIB_B2

Raile stump diameter inside bark equation coefficient B2. This is equivalent to coefficient B from table 2 in Raile (1982). See appendix M for details on biomass equations.

This coefficient is used along with RAILE_STUMP_DIB_B1 in an equation to estimate diameter inside bark at any point on the stump from ground to 1 foot high. From this, volume inside bark is estimated for the selected height along the stump. Volume inside bark is subtracted from volume outside bark to estimate bark volume. Both volumes are converted to biomass using either wood or bark specific gravities. (DIB and DIA are in inches, HT is in feet.)

DIB = (DIA * RAILE_STUMP_DIB_B1) +

(DIA * RAILE_STUMP_DIB_B2 * (4.5-HT) / (HT+1))

62. CWD_DECAY_RATIO1

Coarse woody debris decay ratio 1. Ratio of decayed to sound wood weight of CWD indicated by decay class 1.

63. CWD_DECAY_RATIO2

Coarse woody debris decay ratio 2. Ratio of decayed to sound wood weight of CWD indicated by decay class 2.

64. CWD_DECAY_RATIO3

Coarse woody debris decay ratio 3. Ratio of decayed to sound wood weight of CWD indicated by decay class 3.

65. CWD_DECAY_RATIO4

Coarse woody debris decay ratio 4. Ratio of decayed to sound wood weight of CWD indicated by decay class 4.

66. CWD_DECAY_RATIO5

    Coarse woody debris decay ratio 5. Ratio of decayed to sound wood weight of CWD indicated by decay class 5.

67. DWM_CARBON_RATIO

    Down woody debris carbon ratio. Ratio of carbon to dry wood weight.

68. STANDING_DEAD_DECAY_RATIO1

    Standing dead decay ratio 1. Ratio of decayed wood density to undecayed wood density as indicated by decay class 1.

69. STANDING_DEAD_DECAY_RATIO2

    Standing dead decay ratio 2. Ratio of decayed wood density to undecayed wood density as indicated by decay class 2.

70. STANDING_DEAD_DECAY_RATIO3

    Standing dead decay ratio 3. Ratio of decayed wood density to undecayed wood density as indicated by decay class 3.

71. STANDING_DEAD_DECAY_RATIO4

    Standing dead decay ratio 4. Ratio of decayed wood density to undecayed wood density as indicated by decay class 4.

72. STANDING_DEAD_DECAY_RATIO5

    Standing dead decay ratio 5. Ratio of decayed wood density to undecayed wood density as indicated by decay class 5.

73. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

74. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

75. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

76. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

77. MODIFIED_DATE

Modified date. See SURVEY.MODIFIED_DATE description for definition.

78. MODIFIED_IN_INSTANCE

Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Plant Dictionary (Oracle table name is REF_PLANT_DICTIONARY)

	Column Name	Descriptive Name	Oracle Data Type
1	CN	Sequence number	VARCHAR2(34)
2	SYMBOL_TYPE	Symbol type	VARCHAR2(20)
3	SYMBOL	Symbol	VARCHAR2(16)
4	SCIENTIFIC_NAME	Scientific name	VARCHAR2(100)
5	NEW_SYMBOL	New symbol	VARCHAR2(16)
6	NEW_SCIENTIFIC_NAME	New scientific name	VARCHAR2(100)
7	COMMON_NAME	Common name	VARCHAR2(100)
8	CATEGORY	Category	VARCHAR2(15)
9	FAMILY	Family	VARCHAR2(25)
10	GROWTH_HABIT	Growth habit	VARCHAR2(50)
11	DURATION	Duration	VARCHAR2(50)
12	US_NATIVITY	United States nativity	VARCHAR2(100)
13	STATE_DISTRIBUTION	State distribution	VARCHAR2(300)
14	STATE_AND_PROVINCE	State and province	VARCHAR2(500)
15	SCIENTIFIC_NAME_W_AUTHOR	Scientific name with author	VARCHAR2(500)
16	GENERA_BINOMIAL_AUTHOR	Genera binomial author	VARCHAR2(100)
17	TRINOMIAL_AUTHOR	Trinomial author	VARCHAR2(100)
18	QUADRINOMIAL_AUTHOR	Quadrinomial author	VARCHAR2(100)
19	XGENUS	Cross genus	VARCHAR2(1)
20	GENUS	Genus	VARCHAR2(40)
21	XSPECIES	Cross species	VARCHAR2(1)
22	SPECIES	Species	VARCHAR2(50)
23	SSP	Subspecies indicator “ssp”	VARCHAR2(4)
24	XSUBSPECIES	Cross-subspecies	VARCHAR2(1)
25	SUBSPECIES	Subspecies	VARCHAR2(30)
26	VAR	Variety indicator “var”	VARCHAR2(4)
27	XVARIETY	Cross variety	VARCHAR2(1)
28	VARIETY	Variety	VARCHAR2(30)
29	SUBVAR	Subspecies indicator “subvar”	VARCHAR2(7)
30	SUBVARIETY	Subvariety	VARCHAR2(30)
31	F	Forma indicator “f”	VARCHAR2(2)
32	FORMA	Forma	VARCHAR2(30)
33	NOTES	Notes	VARCHAR2(2000)
34	CREATED_BY	Created by	VARCHAR2(30)
35	CREATED_DATE	Created date	DATE
36	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)

	Column Name	Descriptive Name	Oracle Data Type
37	MODIFIED_BY	Modified by	VARCHAR2(30)
38	MODIFIED_DATE	Modified date	DATE
39	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	RPD_PK
Unique	SYMBOL_TYPE, SYMBOL, NEW_SYMBOL	N/A	RPD_UK

1. CN — Sequence number. A unique sequence number used to identify a reference plant dictionary table record.

2. SYMBOL_TYPE

   Symbol type. This attribute describes the type of NRCS PLANTS symbol (from the January 1, 2010 download of the database).

Code	Symbol type
Species	Accepted symbol identified to species, subspecies, or variety
Genus	Accepted symbol identified to genus
Old	Synonym symbol for an old scientific name
Unknown	Symbol used to identify generic categories of unknown plants

3. SYMBOL — Symbol. The NRCS PLANTS database code (from the January 1, 2010 download) used to represent a plant species and populate VEG_SPCD.

4. SCIENTIFIC_NAME

   Scientific name. The NRCS PLANTS database scientific name for SYMBOL.

5. NEW_SYMBOL

   New symbol. Populated only when SYMBOL_TYPE = old. Represents the new NRCS PLANTS database accepted code that has been reclassified from the old synonym symbol.

6. NEW_SCIENTIFIC_NAME

   New scientific name. Populated only when SYMBOL_TYPE = old. Represents the new NRCS PLANTS database accepted code that has been reclassified from the old synonym scientific name.

7. COMMON_NAME

   Common name. The NRCS PLANTS database common name associated with the species SYMBOL.

8. CATEGORY Category. Indicates the broad taxonomic category for the symbol. Attribute is null (blank) when SYMBOL = unknown.

Code	Category
Dicot	Division Magnoliophyta; Class Magnoliopsida
Fern	Division Pteridophyta
Gymnosperm	Division Coniferophyta (conifers)
Horsetail	Division Equisetophyta
Lycopod	Division Lycopdiophyta; Class Lycopodiopsida; Order Lycopodiales (clubmoss)
Monocot	Division Magnoliophyta; Class Liliopsida
Psilophyte	Division Psilophyta (whisk-ferns)
Quillwort	Division Lycopdiophyta; Class Lycopodiopsida; Order Isoetales

9. FAMILY Family. The NRCS PLANTS database family name associated with the species SYMBOL.

10. GROWTH_HABIT

    Growth habit. The growth habit of the symbol according to the NRCS PLANTS database (2010 download). Some plants have different growth habits depending on environment or location, so a plant can have more than one value. Code descriptions are from the NRCS PLANTS documentation.

Code	Growth habit
Forb / herb	Vascular plant without significant woody tissue above or at the ground. Forbs and herbs may be annual, biennial, or perennial but always lack significant thickening by secondary woody growth and have perennating buds borne at or below the ground surface. In PLANTS, graminoids are excluded, but ferns, horsetails, lycopods, and whisk-ferns are included.
Graminoid	Grass or grass-like plant, including grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), arrow-grasses (Juncaginaceae), and quillworts (*Isoetes*).
Liana	Climbing plant found in tropical forests with long, woody rope-like stems of anomalous anatomical structure.
Shrub	Grass or grass-like plant, including grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), arrow-grasses (Juncaginaceae), and quillworts (*Isoetes*).
Subshrub	Climbing plant found in tropical forests with long, woody rope-like stems of anomalous anatomical structure.
Tree	Perennial, woody plant with a single stem (trunk), normally greater than 4 to 5 meters (13 to 16 feet) in height; under certain environmental conditions, some tree species may develop a multi-stemmed or short growth form (less than 4 meters or 13 feet in height).
Vine	Twining/climbing plant with relatively long stems, can be woody or herbaceous.

11. DURATION Duration. The duration of a plant according to the NRCS PLANTS database (2010 download). Some plants have different growth habits depending on environment or location, so a plant can have more than one value.

Code	Duration
Annual	Individual completes life cycle in a single year.
Biennial	Individual completes life cycle over two growing seasons.
Perennial	Individuals live for many years, including herbaceous plants that resprout from roots.
Unknown	Life cycle and duration unknown.

12. US_NATIVITY

The United States nativity of the species represented by the symbol. A plant that is native to any part of the US is considered Native, even if some populations within the United States are introduced. However, a plant like dandelion (*Taraxacum officinale*) with some populations that are native to the US and some that are native to another country is considered Native and Introduced.

Native:

Code	United States nativity
N	Native
N?	Probably Native
NI	Native and Introduced – some infra-taxa are native and others are introduced
NI?	Native and Probably Introduced – some infra-taxa are native and others are probably introduced

Introduced:

Code	United States nativity
GP	Garden persistent – persists around gardens and old habitations, not naturalized
GP?	Probably Garden persistent – persists around gardens and old habitations, not naturalized
I	Introduced
I?	Probably Introduced
N?I	Probably Native and Introduced – some infra-taxa are probably native and others are introduced
W	Waif – an ephemeral introduction, not persistently naturalized
W?	Probably a Waif – an ephemeral introduction, not persistently naturalized

13. STATE_DISTRIBUTION

State distribution. State distribution of the plant according to NRCS PLANTS database download of January 1, 2010.

14. STATE_AND_PROVINCE

State and province. State and province distribution of the of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

15. SCIENTIFIC_NAME_W_AUTHOR

    Scientific name with author. Scientific name with author of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

16. GENERA_BINOMIAL_AUTHOR

    Genera binomial author. Genera binomial author of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

17. TRINOMIAL_AUTHOR

    Trinomial author. Trinomial author of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

18. QUADRINOMIAL_AUTHOR

    Quadrinomial author. Quadrinomial author of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

19. XGENUS Cross genus. The cross-genus hybridization indicator.

20. GENUS Genus. The NRCS PLANTS database genus name associated with the species symbol.

21. XSPECIES Cross species. The cross-species hybridization indicator.

22. SPECIES Species, individual. The NRCS PLANTS database species name associated with the species symbol.

23. SSP Subspecies indicator “ssp.”

24. XSUBSPECIES

    Cross-subspecies. Cross-subspecies hybridization indicator.

25. SUBSPECIES Subspecies.

26. VAR Variety indicator “var.”

27. XVARIETY Cross-variety. Cross-variety hybridization indicator.

28. VARIETY Variety. The NRCS PLANTS database variety name associated with the species symbol.

29. SUBVAR Subspecies indicator “subvar.” Subspecies indicator “subvar” of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

30. SUBVARIETY Subvariety. Subvariety of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

31. F Forma indicator “f.” Forma indicator “f” of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

32. FORMA Forma. Forma of the plant according to the NRCS PLANTS 2010 database download of January 1, 2010.

33. NOTES Notes.

34. CREATED_BY

    Created by. See SURVEY.CREATED_BY description for definition.

35. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

36. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

37. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

38. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

39. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Species Group Table (Oracle table name is REF_SPECIES_GROUP)

	Column name	Descriptive name	Oracle data type
1	SPGRPCD	Species group code	NUMBER(2)
2	NAME	Name	VARCHAR2(40)
3	REGION	Region	VARCHAR2(8)
4	CLASS	Class	VARCHAR2(8)
5	CREATED_BY	Created by	VARCHAR2(30)
6	CREATED_DATE	Created date	DATE
7	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
8	MODIFIED_BY	Modified by	VARCHAR2(30)
9	MODIFIED_DATE	Modified date	DATE
10	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	SPGRPCD	N/A	SGP_PK

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

2. NAME Name. A descriptive name for each species group code (SPGRPCD). The names associated with these codes are used to label rows or columns in national standard presentation tables.

3. REGION Region. A description of the section of the United States in which the species, and therefore species group is commonly found. Values are ‘EASTERN’ and ‘WESTERN.’

4. CLASS Class. A descriptor for the classification of the species type within the species group. Values are ‘SOFTWOOD’ and ‘HARDWOOD.’

5. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

6. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

7. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

8. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

9. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

10. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Invasive Species Table (Oracle table name is REF_INVASIVE_SPECIES)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	STATECD	State code	NUMBER(4)
3	SYMBOL	Symbol	VARCHAR2(16)
4	INV_GROUP_CD	Invasive group code	NUMBER
5	UNITCD_LIST	Unit code list	VARCHAR2(20)
6	START_DATE	Start date	DATE
7	END_DATE	End date	DATE
8	MANUAL_START	Manual start	NUMBER(3,1)
9	MANUAL_END	Manual end	NUMBER(3,1)
10	NOTES	Notes	VARCHAR2(2000)
11	CREATED_BY	Created by	VARCHAR2(30)
12	CREATED_DATE	Created date	DATE
13	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
14	MODIFIED_BY	Modified by	VARCHAR2(30)
15	MODIFIED_DATE	Modified date	DATE
16	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	RIS_PK
Unique	STATECD, SYMBOL	N/A	RIS_UK

1. CN Sequence number. A unique sequence number used to identify a reference invasive species record.

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

3. SYMBOL Symbol. The NRCS code (2010 download) used to represent a plant species.

4. INV_GROUP_CD

   Invasive group code. Invasive species group code allows multiple species that are difficult to distinguish from one another to be recorded as the most likely species in the invasive species group, or the first one in the group if the field person was not sure. These groups are typically defined by region.

5. UNITCD_LIST Unit code list. This defines a list of unit codes within the state where the species is likely to be found (e.g., to differentiate E vs. W Oregon and Washington).

6. START_DATE Start date.

7. END_DATE End date.

8. MANUAL_START

   Manual start. The first version of the Field Guide (PLOT.MANUAL) that the invasive species (SYMBOL) began to be used.

9. MANUAL_END

   Manual end. The last version of the Field Guide (PLOT.MANUAL) that the invasive species (SYMBOL) was valid. When MANUAL_END is blank (null), the code is still valid.

10. NOTES Notes. Notes on this invasive species for this state (e.g., why added to list, why removed from list, etc.)

11. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

12. CREATED_DATE

    Created date. See SURVEY.CREATED_DATE description for definition.

13. CREATED_IN_INSTANCE

    Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

14. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

15. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

16. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Habitat Type Description Table (Oracle table name is REF_HABTYP_DESCRIPTION)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	HABTYPCD	Habitat type code	VARCHAR2(10)
3	PUB_CD	Publication code	VARCHAR2(10)
4	SCIENTIFIC_NAME	Scientific name	VARCHAR2(115)
5	COMMON_NAME	Common name	VARCHAR2(255)
6	VALID	Valid	VARCHAR2(1)
7	CREATED_BY	Created by	VARCHAR2(30)
8	CREATED_DATE	Created date	DATE
9	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
10	MODIFIED_BY	Modified by	VARCHAR2(30)
11	MODIFIED_DATE	Modified date	DATE
12	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	RHN_PK
Unique	HABTYPCD, PUB_CD	N/A	RHN_UK
Foreign	PUB_CD	REF_HABTYP_DESCRIPTION to REF_HABTYP_PUBLICATION	RHN_RPN_FK

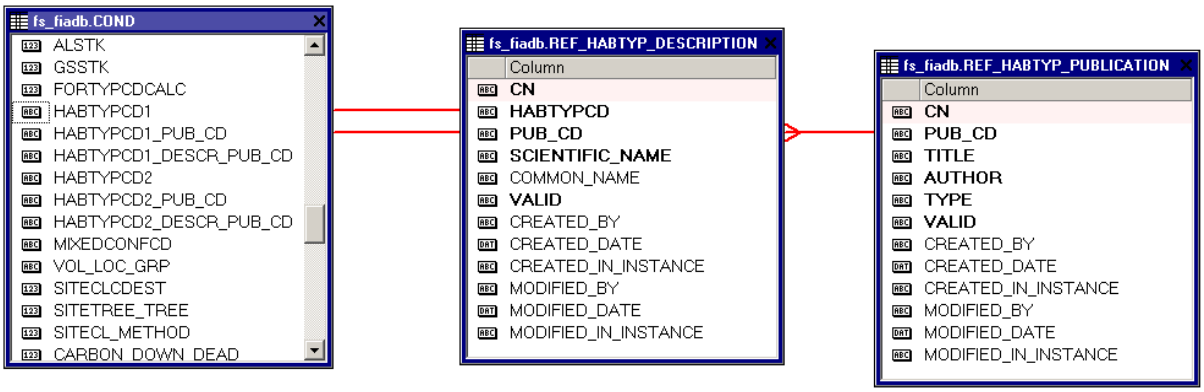


Figure 6. Illustration of how publication information can be derived.

1. CN Sequence number. A unique sequence number used to identify a habitat type description record.

2. HABTYPCD Habitat type code. A code representing a habitat type. Unique codes are determined by combining both habitat type code and publication code (HABTYPCD and PUB_CD).

3. PUB_CD Publication code. A code indicating the publication that lists the name associated with a particular habitat type code (HABTYPCD).

4. SCIENTIFIC_NAME

   Scientific name. This attribute contains some type of descriptor, usually the Latin name, of the plant(s) associated with the habitat type code. It has values such as the entire scientific name or the shortened synonym of the plant(s) represented by the habitat type code or it may have an English geographic type of descriptor.

5. COMMON_NAME

   Common name. This attribute contains some type of descriptor, usually the common name, of the plant(s) associated with the habitat type code.

6. VALID Valid. A flag to indicate if this is a valid, documented habitat type code. Values are Y and N.

7. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

8. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

9. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

10. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

11. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

12. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Habitat Type Publication Table (Oracle table name is REF_HABTYP_PUBLICATION)

	Column name	Descriptive name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PUB_CD	Publication code	VARCHAR2(10)
3	TITLE	Title of publication	VARCHAR2(200)
4	AUTHOR	Author of publication	VARCHAR2(200)
5	TYPE	Type of publication	VARCHAR2(10)
6	VALID	Valid	VARCHAR2(1)
7	CREATED_BY	Created by	VARCHAR2(30)
8	CREATED_DATE	Created date	DATE
9	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
10	MODIFIED_BY	Modified by	VARCHAR2(30)
11	MODIFIED_DATE	Modified date	DATE
12	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	RPN_PK
Unique	PUB_CD	N/A	RPN_UK

1. CN — Sequence number. A unique sequence number used to identify a habitat type publication record.
2. PUB_CD — Publication code. A code indicating the publication that lists the name associated with a particular habitat type code (REF_HABTYP_DESCRIPTION.HABTYPCD).
3. TITLE — Title. The title of the publication defining particular habitat types.
4. AUTHOR — Author. The author of the publication defining particular habitat types.
5. TYPE — Type. An attribute describing if the habitat type publication describes potential vegetation or existing vegetation. Values are PVREF and EVREF. If it is unknown which type of habitat is being described, then TYPE = ?.
6. VALID — Valid. A flag to indicate if this publication is valid for FIA. Values are Y and N.
7. CREATED_BY — Created by. See SURVEY.CREATED_BY description for definition.
8. CREATED_DATE — Created date. See SURVEY.CREATED_DATE description for definition.

9. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

10. MODIFIED_BY

    Modified by. See SURVEY.MODIFIED_BY description for definition.

11. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

12. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Citation Table (Oracle table name is REF_CITATION)

	Column name	Descriptive name	Oracle data type
1	CITATION_NBR	Citation number	NUMBER(7)
2	CITATION	Citation	VARCHAR2(2000)
3	CREATED_BY	Created by	VARCHAR2(30)
4	CREATED_DATE	Created date	DATE
5	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
6	MODIFIED_BY	Modified by	VARCHAR2(30)
7	MODIFIED_DATE	Modified date	DATE
8	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	CITATION_NBR	N/A	CIT_PK

1. CITATION_NBR

   Citation number. A unique number used to identify a REF_CITATION record. Citation information is currently available in the database only for information about the source of specific gravity and bark volume percent values contained in the REF_SPECIES table. REF_SPECIES variables ending in "_CIT" link back to the REF_CITATION table through CITATION_NBR.

2. CITATION Citation. This attribute is usually a publication citation. In some cases CITATION may contain more specific information about how data were populated for a field.

3. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

4. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

5. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

6. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

7. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

8. MODIFIED_IN_INSTANCE

Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Forest Inventory and Analysis Database Version Table (Oracle table name is REF_FIADB_VERSION)

	Column name	Descriptive name	Oracle data type
1	VERSION	Version number	VARCHAR2(40)
2	DESCR	Version description	VARCHAR2(2000)
3	CREATED_BY	Created by	VARCHAR2(30)
4	CREATED_DATE	Created date	DATE
5	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
6	MODIFIED_BY	Modified by	VARCHAR2(30)
7	MODIFIED_DATE	Modified date	DATE
8	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
9	INSTALL_TYPE	Install type	VARCHAR2(10)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	VERSION	N/A	RFN_PK

1. VERSION Version number. A unique number used to identify a REF_FIADB_VERSION record. VERSION equals the currently available version of the FIADB.

2. DESCR Version description. A description of the FIADB version. This may include a literature citation and internet links to documentation.

3. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

4. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

5. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

6. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

7. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

8. MODIFIED_IN_INSTANCE

   Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

9. INSTALL_TYPE

Install type. This attribute is intentionally left blank in download files.

Reference State Elevation Table (Oracle table name is REF_STATE_ELEV)

	Column name	Descriptive name	Oracle data type
1	STATECD	State code	NUMBER(4)
2	MIN_ELEV	Minimum elevation	NUMBER(5)
3	MAX_ELEV	Maximum elevation	NUMBER(5)
4	LOWEST_POINT	Lowest point	VARCHAR2(30)
5	HIGHEST_POINT	Highest point	VARCHAR2(30)
6	CREATED_BY	Created by	VARCHAR2(30)
7	CREATED_DATE	Created date	DATE
8	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
9	MODIFIED_BY	Modified by	VARCHAR2(30)
10	MODIFIED_DATE	Modified date	DATE
11	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	STATECD	N/A	RSE_PK

1. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B.

2. MIN_ELEV Minimum elevation. The minimum elevation within the State in feet.

3. MAX_ELEV Maximum elevation. The maximum elevation within the State in feet.

4. LOWEST_POINT

   Lowest point. The name of the lowest point within the State. ‘SL’ refers to sea level. Negative minimum elevations are listed here.

5. HIGHEST_POINT

   Highest point. The name of the highest point within the State. Alternative names are provided also.

6. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

7. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

8. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

9. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

10. MODIFIED_DATE

    Modified date. See SURVEY.MODIFIED_DATE description for definition.

11. MODIFIED_IN_INSTANCE

    Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Reference Unit Table (Oracle table name is REF_UNIT)

	Column name	Descriptive name	Oracle data type
1	STATECD	State code	NUMBER(4)
2	VALUE	Value	NUMBER(2)
3	MEANING	Meaning	VARCHAR2(80)
4	CREATED_BY	Created by	VARCHAR2(30)
5	CREATED_DATE	Created date	DATE
6	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
7	MODIFIED_BY	Modified by	VARCHAR2(30)
8	MODIFIED_DATE	Modified date	DATE
9	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of key	Column(s) order	Tables to link	Abbreviated notation
Primary	STATECD, VALUE	N/A	UNT_PK

1. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each State. Refer to appendix B.

2. VALUE Value. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each State. For periodic inventories, survey units may be made up of lands of particular owners. Refer to appendix B for codes.

3. MEANING Meaning. The name corresponding to the survey unit code (VALUE) in the State (STATECD). Refer to appendix B.

4. CREATED_BY Created by. See SURVEY.CREATED_BY description for definition.

5. CREATED_DATE

   Created date. See SURVEY.CREATED_DATE description for definition.

6. CREATED_IN_INSTANCE

   Created in instance. See SURVEY.CREATED_IN_INSTANCE description for definition.

7. MODIFIED_BY

   Modified by. See SURVEY.MODIFIED_BY description for definition.

8. MODIFIED_DATE

   Modified date. See SURVEY.MODIFIED_DATE description for definition.

9. MODIFIED_IN_INSTANCE

Modified in instance. See SURVEY.MODIFIED_IN_INSTANCE description for definition.

Chapter 4 – Calculating Population Estimates and Their Associated Sampling Errors

This chapter presents procedures written in Oracle™ SQL script that can be used to obtain population estimates (and associated sampling errors) for standard FIA attributes from the measurement data stored in the FIADB. These estimates follow the equations presented in Bechtold and Patterson (2005, chapter 4). Population estimates for many attributes can be generated using either the web-based EVALIDator tool or the Forest Inventory Data Online (FIDO) tool, which provides interactive access to the FIADB. These tools can be found at http://fia.fs.fed.us/tools-data.

All data stored in FIADB can be downloaded from http://fia.fs.fed.us/tools-data as either comma delimited files or Microsoft (MS) Access databases. Because of size limitations, data are stored in individual State databases. Because MS Access SQL scripts differ from the Oracle™ SQL scripts described in this chapter, MS Access SQL queries are provided in the MS Access databases. These scripts can be used as a starting point to create customized queries suitable for local or regional analyses.

The FIADB can be used to estimate many attributes (e.g., forest area, timberland area, number of trees, net volume, biomass) from many different samples (typically State-wide inventories for a specific year or set of years). Therefore, the number of estimates that can be made from the FIADB is very large, and continues to increase as more data are added to the FIADB. This chapter provides examples of a few estimation procedures that can be modified by the user. **The resulting estimates shown as output are examples only and are not necessarily the exact numbers a user will obtain using current data.**

In addition to the naming conventions used in the FIADB, reference is made to the notation and terminology used in Bechtold and Patterson (2005). To fully understand the statistical basis of the estimation, readers may find it useful to refer to that publication as they review this chapter. Examples that estimate area of timberland, number of live trees on forest land, number of seedlings on timberland, and volume of growing-stock trees on timberland are presented, along with discussion of how these examples can be modified to estimate other attributes measured in Phase 2.

The basic estimation is broken down into four steps, with additional steps for users who want to go beyond the traditional population-level estimates.

1. Selecting the attribute of interest (the quantity that is to be estimated).
2. Selecting an appropriate sample.
3. Linking the appropriate tables in the FIADB to produce estimates for attributes of interest for a population.
4. Producing estimates with sampling errors for attributes of interest for a population.
5. Restricting the attribute of interest to a smaller subset of the population (e.g., filtering the data to include only sawtimber stands on publicly owned timberland, versus all stands in all ownerships).
6. Changing the attribute of interest with user-defined criteria.

7. Estimating change over time (which may or may not be statistically significant) on the standard 4-subplot fixed-area plot.

1. Selecting the attribute of interest (using the REF_POP_ATTRIBUTE table)

The most common attributes of interest in FIADB estimation are described in the REF_POP_ATTRIBUTE table. Attributes are defined at three levels (1) condition level attributes for area estimates; (2) tree level attributes for numbers of trees, volume, growth, removals, and mortality estimates; and (3) seedling level attributes for number of seedlings estimates. Estimation of condition level attributes requires accessing data on the PLOT and COND tables. Estimation of tree level attributes requires accessing data on the PLOT, COND, and TREE tables. Estimation of seedling level attributes requires accessing data on the PLOT, COND, and SEEDLING tables. Table 4.1 lists the attributes currently defined in the REF_POP_ATTRIBUTE table.

Table 4.1. Values and Descriptions in the REF_POP_ATTRIBUTE table

Attribute Number (ATTRIBUTE_NBR)	Attribute Description (ATTRIBUTE_DESCR)
1	Area of sampled and nonsampled land and water, in acres, within U.S. boundary
2	Area of forest land, in acres
3	Area of timberland, in acres
4	Number of live trees (at least 1 inch d.b.h./d.r.c.), in trees, on forest land
5	Number of growing-stock trees (at least 5 inches d.b.h.), in trees, on forest land
6	Number of standing-dead trees (at least 5 inches d.b.h./d.r.c.), in trees, on forest land
7	Number of live trees (at least 1 inch d.b.h./d.r.c.), in trees, on timberland
8	Number of growing-stock trees (at least 5 inches d.b.h.), in trees, on timberland
9	Number of standing-dead trees (at least 5 inches d.b.h./d.r.c.), in trees, on timberland
10	Aboveground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
11	Dry weight of merchantable bole for live trees (timber species at least 5 inches d.b.h.), in short tons, on forest land
12	Dry weight of merchantable bole for live trees (timber species at least 5 inches d.b.h.), in short tons, on timberland
13	Aboveground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on timberland
14	Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land
15	Net volume of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on forest land
16	Net volume of saw-log portion of sawtimber trees, in cubic feet, on forest land
17	Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
18	Net volume of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on timberland
19	Net volume of saw-log portion of sawtimber trees, in cubic feet, on timberland
20	Net volume of sawtimber trees, in board feet (International ¼-inch rule), on forest land
21	Net volume of sawtimber trees, in board feet (International ¼-inch rule), on timberland
22	Gross volume of sawtimber trees, in board feet (International ¼-inch rule), on forest land
23	Gross volume of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land

Attribute Number (ATTRIBUTE_NBR)	Attribute Description (ATTRIBUTE_DESCR)
24	Sound volume of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land
25	Average annual net growth of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land
26	Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on forest land
27	Average annual net growth of sawtimber trees, in board feet (International ¼-inch rule), on forest land
28	Average annual net growth of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
29	Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on timberland
30	Average annual net growth of sawtimber trees, in board feet (International ¼-inch rule), on timberland
31	Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land
32	Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in trees, on forest land
33	Average annual mortality of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on forest land
34	Average annual mortality of sawtimber trees, in board feet (International ¼-inch rule), on forest land
35	Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
36	Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in trees, on timberland
37	Average annual mortality of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on timberland
38	Average annual mortality of sawtimber trees, in board feet (International ¼-inch rule), on timberland
39	Average annual removals of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land
40	Average annual removals of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on forest land
41	Average annual removals of sawtimber trees, in board feet (International ¼-inch rule), on forest land
42	Average annual removals of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
43	Average annual removals of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on timberland
44	Average annual removals of sawtimber trees, in board feet (International ¼-inch rule), on timberland
45	Number of live seedlings (less than 1 inch d.b.h./d.r.c.), in seedlings, on forest land
46	Number of live seedlings (less than 1 inch d.b.h./d.r.c.), in seedlings, on timberland
47	Above and belowground carbon in standing-dead trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
48	Aboveground carbon in live seedlings, shrubs, and bushes, in short tons, on forest land
49	Belowground carbon in live seedlings, shrubs, and bushes, in short tons, on forest land
50	Carbon in stumps, coarse roots, and coarse woody debris, in short tons, on forest land
51	Carbon in litter, in short tons, on forest land

Attribute Number (ATTRIBUTE_NBR)	Attribute Description (ATTRIBUTE_DESCR)
52	Carbon in organic soil, in short tons, on forest land
53	Aboveground carbon in live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
54	Belowground carbon in live trees (at least 1 inch d.b.h./d.r.c.) in short tons on forest land
55	Above and belowground carbon in live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
56	Dry weight of tops and limbs for live trees (timber species at least 5 inches d.b.h.), in short tons, on forest land
57	Aboveground dry weight of live saplings (timber species at least 1 and less than 5 inches d.b.h.), in short tons, on forest land
58	Dry weight of stumps for live trees (timber species at least 5 inches d.b.h.), in short tons, on forest land
59	Belowground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
60	Aboveground dry weight of live trees (woodland species at least 1 inch d.r.c.), in short tons, on forest land
61	Above and belowground carbon in standing-dead trees (at least 1 inch d.b.h./d.r.c.), in short tons, on timberland
62	Aboveground carbon in live seedlings, shrubs, and bushes, in short tons, on timberland
63	Belowground carbon in live seedlings, shrubs, and bushes, in short tons, on timberland
64	Carbon in stumps, coarse roots, and coarse woody debris, in short tons, on timberland
65	Carbon in litter, in short tons, on timberland
66	Carbon in organic soil, in short tons, on timberland
67	Aboveground carbon in live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on timberland
68	Belowground carbon in live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on timberland
69	Above and belowground carbon in live trees (at least 1 inch d.b.h./d.r.c.) in short tons on timberland
70	Dry weight of tops and limbs for live trees (timber species at least 5 inches d.b.h.), in short tons, on timberland
71	Aboveground dry weight of live saplings (timber species at least 1 and less than 5 inches d.b.h.), in short tons, on timberland
72	Dry weight of stumps for live trees (timber species at least 5 inches d.b.h.), in short tons, on timberland
73	Belowground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on timberland
74	Aboveground dry weight of live trees (woodland species at least 1 inch d.r.c.), in short tons, on timberland
75	Aboveground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land calculated with retired regional methods
76	Aboveground merchantable dry weight of live trees (at least 5 inches d.b.h./d.r.c.), in short tons, on forest land calculated with retired regional methods
77	Aboveground merchantable dry weight of live trees (at least 5 inches d.b.h./d.r.c.), in short tons, on timberland calculated with retired regional methods
78	Aboveground dry weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on timberland calculated with retired regional methods
79	Area of sampled land and water, in acres
80	Average annual harvest removals of live trees (at least 5 inches d.b.h./d.r.c.), in

Attribute Number (ATTRIBUTE_NBR)	Attribute Description (ATTRIBUTE_DESCR)
	cubic feet, on forest land
81	Average annual harvest removals of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on forest land
82	Average annual harvest removals of sawtimber trees, in board feet (International ¼-inch rule), on forest land
83	Average annual harvest removals of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
84	Average annual harvest removals of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on timberland
85	Average annual harvest removals of sawtimber trees, in board feet (International ¼-inch rule), on timberland
86	Average annual other removals of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land
87	Average annual other removals of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on forest land
88	Average annual other removals of sawtimber trees, in board feet (International ¼-inch rule), on forest land
89	Average annual other removals of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
90	Average annual other removals of growing-stock trees (at least 5 inches d.b.h.), in cubic feet, on timberland
91	Average annual other removals of sawtimber trees, in board feet (International ¼-inch rule), on timberland
92	Net volume of standing-dead trees (at least 5 inches d.b.h./d.r.c.) in cubic feet on forest land
93	Net volume of standing-dead trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on timberland
94	Aboveground dry weight of bark for live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
95	Aboveground green weight of live trees (at least 1 inch d.b.h./d.r.c.), in short tons, on forest land
96	Aboveground dry weight of standing-dead trees (at least 5 inches d.b.h./d.r.c.), in short tons, on forest land
97	Total carbon, in short tons, on forest land
98	Forest carbon pool 1: live aboveground, in metric tonnes, on forest land
99	Forest carbon pool 2: live belowground, in metric tonnes, on forest land
100	Forest carbon pool 3: dead wood, in metric tonnes, on forest land
101	Forest carbon pool 4: litter, in metric tonnes, on forest land
102	Forest carbon pool 5: soil organic, in metric tonnes, on forest land
103	Forest carbon total: all 5 pools, in metric tonnes, on forest land
104	Total volume of FWD (small) pieces, in cubic feet, on forest land
105	Dry weight of FWD (small) pieces, in short tons, on forest land
106	Carbon in FWD (small) pieces, in short tons, on forest land
107	Total volume of FWD (medium) pieces, in cubic feet, on forest land
108	Dry weight of FWD (medium) pieces, in short tons, on forest land
109	Carbon in FWD (medium) pieces, in short tons, on forest land
110	Total volume of FWD (large) pieces, in cubic feet, on forest land
111	Dry weight of FWD (large) pieces, in short tons, on forest land
112	Carbon in FWD (large) pieces, in short tons, on forest land
113	Number of CWD pieces, in pieces, on forest land
114	Total volume of CWD, in cubic feet, on forest land
115	Dry weight of CWD, in short tons, on forest land

Attribute Number (ATTRIBUTE_NBR)	Attribute Description (ATTRIBUTE_DESCR)
116	Carbon in CWD, in short tons, on forest land
117	Total volume of DWM piles, in cubic feet, on forest land
118	Dry weight of DWM piles, in short tons, on forest land
119	Carbon in DWM piles, in short tons, on forest land
120	Total volume of FWD (all sizes) pieces, in cubic feet, on forest land
121	Dry weight of FWD (all sizes) pieces, in short tons, on forest land
122	Carbon in FWD (all sizes) pieces, in short tons, on forest land
123	Total column of DWM (FWD, CWD and piles), in cubic feet, on forest land
124	Total dry weight of DWM (FWD, CWD and piles), in short tons, on forest land
125	Total carbon in DWM (FWD, CWD and piles), in short tons, on forest land
126	Area change – sampled at both inventories by remeasured plots
127	Area change – area forest land both measurements from remeasured plots
128	Area change – area forest land either measurement from remeasured plots
129	Area change – area timberland both measurements from remeasured plots
130	Area change – area timberland either measurement from remeasured plots

In this chapter we present examples that estimate:

- Area of timberland (REF_POP_ATTRIBUTE.ATTRIBUTE_NBR = 3),
- Number of live trees on forest land (REF_POP_ATTRIBUTE.ATTRIBUTE_NBR = 4),
- Net volume of growing-stock trees on timberland (REF_POP_ATTRIBUTE.ATTRIBUTE_NBR = 18, and
- Number of live seedlings on timberland (REF_POP_ATTRIBUTE.ATTRIBUTE_NBR = 46).

These are examples of condition, tree, and seedling level attributes that can be modified to produce other estimates of attributes at these levels. For each attribute, the REF_POP_ATTRIBUTE table contains a unique ATTRIBUTE_NBR, a description of the attribute (ATTRIBUTE_DESCR), and the variables EXPRESSION and WHERE_CLAUSE that are both portions of the SQL statements used to produce the estimates of the attribute. Table 4.2 lists these four variables for the four examples we are presenting. (**Note**: In EXPRESSION and WHERE_CLAUSE, 'c' stands for COND table, 't' stands for TREE table, 's' stands for SEEDLING table, and 'pet' stands for POP_EVAL_TYP table.)

Table 4.2. REF_POP_ATTRIBUTE entries for the four examples presented in this chapter

ATTRIBUTE NBR	ATTRIBUTE DESCR	EXPRESSION [a]	WHERE CLAUSE
3	Area of timberland, in acres	c.condprop_unadj* decode(c.prop_basis,'MACR',pop_stratum.adj_factor_macr, pop_stratum.adj_factor_subp)	and pet.eval_typ='EXPCURR' and c.cond_status_cd=1 and c.reservcd=0 and c.siteclcd in (1,2,3,4,5,6)
4	Number of all live trees (at least 1 inch d.b.h/d.r.c), in trees, on forest land	t.tpa_unadj* decode(dia,null,adj_factor_subp, decode(least(dia,5-0.001),dia,adj_factor_micr, decode(least(dia, nvl(MACRO_BREAKPOINT_DIA,9999)-0.001),dia,adj_factor_subp,adj_factor_macr)))	and pet.eval_typ='EXPVOL' and t.plt_cn=c.plt_cn and t.condid=c.condid and c.cond_status_cd=1 and t.statuscd=1 and t.dia>=1.0

ATTRIBUTE NBR	ATTRIBUTE DESCR	EXPRESSION [a]	WHERE CLAUSE
18	Net volume of growing-stock trees (at least 5 inches d.b.h), in cubic feet, on timberland	t.tpa_unadj* t.volcfnet* decode(dia,null,adj_factor_subp, decode(least(dia,5-0.001),dia,adj_factor_micr, decode(least(dia, nvl(MACRO_BREAKPOINT_DIA,9999)-0.001),dia,adj_factor_subp,adj_factor_macr)))	and pet.eval_typ='EXPVOL' and t.plt_cn=c.plt_cn and t.condid=c.condid and c.cond_status_cd=1 and c.reservcd=0 and c.siteclcd in (1,2,3,4,5,6) and t.statuscd=1 and t.treeclcd=2
46	Number of live seedlings (less than 1 inch d.b.h/d.r.c), in seedings, on timberland	s.tpa_unadj*adj_factor_micr	and pet.eval_typ='EXPVOL' and s.plt_cn=c.plt_cn and s.condid=c.condid and c.cond_status_cd=1 and c.reservcd=0 and c.siteclcd in (1,2,3,4,5,6)
[a] Note that for Microsoft Access SQL, the decode function is replaced with the IIF function			

EXPRESSION is multiplied by the expansion factor POP_STRATUM.EXPNS and summed at the condition level in the estimation procedure. In the notation used in Bechtold and Patterson (2005), this sum is P_{hid} for area estimation (see equation 4.1, page 47) or y_{hid} for the estimation of tree attributes (see equation 4.8, page 53). In all cases, EXPRESSION consists of the product of two terms, the first term (c.condprop_unadj, t.tpa_unadj, and s.tpa_unadj in our examples) is the unadjusted observation of the attribute of interest (on a per acre basis). The second term is the appropriate stratum adjustment factor. The stratum adjustment factor is the inverse of the mean proportion of the sample plot areas that were within the population. Following the notation of Bechtold and Patterson (2005) this adjustment factor is $1/\bar{p}_{mh}$ (see equation 4.2, page 49). The decode statement simply selects the appropriate adjustment factor to be used for the specific estimate. Area estimates use either ADJ_FACTOR_MACR (in inventories where area estimates are based on the macroplot) or ADJ_FACTOR_SUBP (in inventories where area estimates are based on the subplot) for the adjustment. The adjustment of tree- and seedling-level estimates is based on the plot on which the tree or seedling was sampled (seedlings and trees <5 inches diameter are sampled on the microplot, larger trees are sampled on the subplot or macroplot depending on diameter).

Common selection criteria used often with FIA data when creating queries include various classifications of land and groups of trees as shown below:

Identifying land classes (COND table):

Forest land	COND_STATUS_CD = 1
Timberland	COND_STATUS_CD = 1, SITECLCD <7, RESERVCD = 0
Nonforest land	COND_STATUS_CD = 2
Reserved forest land	COND_STATUS_CD = 1, RESERVCD = 1
Unreserved forest land	COND_STATUS_CD = 1, RESERVCD = 0
Productive forest land	COND_STATUS_CD = 1, SITECLCD <7
Unproductive forest land	COND_STATUS_CD = 1, SITECLCD = 7

Identifying tree characteristics:

Live trees	TREE.STATUSCD = 1
Standing dead trees	TREE.STATUSCD = 2, TREE.STANDING_DEAD_CD = 1
Growing-stock trees	TREE.STATUSCD = 1, TREE.TREECLCD = 2

2. Selecting an appropriate sample (using the POP_EVAL_GRP, POP_EVAL, and POP_EVAL_TYP tables)

In order to compute a sample-based population estimate, the appropriate sample and stratification must be identified. In FIA estimation, the sample is a set of plots that were selected for the attribute of interest that was observed. The stratification consists of an assignment of plots to strata (non-overlapping areas of a known or estimated size) that in aggregate define the population of interest. There is an assignment of plots to every stratum, and all plots are assigned to one, and only one stratum, for each evaluation. FIA uses the term "evaluation" to reference the relationship that links a set of plots to a set of strata for estimation purposes. Thus, an evaluation is a set of plots defined in the FIADB that can be used to make a statistically valid sample-based estimate for a population (area of land) based on a specific stratification.

Each evaluation used by FIA is identified, named, and stored as a single entry in the POP_EVAL table. The important data items in the POP_EVAL table are listed in table 4.3 for all evaluations that are loaded into the FIADB for data collected in Minnesota through 2006. CN is the control number that uniquely identifies the entry and is used in creating links to other tables. RSCD (Region or Station Code) and EVALID (Evaluation Identifier) are the natural identifiers of a specific record. EVAL_DESCR provides a description of the evaluation. STATECD and LOCATION_NM describe the geographic extent of the population that was sampled and REPORT_YEAR_NM describes the years in which the sample was taken. For older periodic inventories, REPORT_YEAR_NM typically reflects a single reporting year (the one used in the FIA publications), even though the plots may have been measured over several years. Annual inventories (taken since 1999) list the years of data measurements used in the estimation. There are usually multiple evaluations for a specific year because not all plots observed have every attribute of interest, and/or different stratifications are used in the estimation of different attributes of interest. For example, volume estimation can be done on plots measured at only one point in time. However, growth estimates require repeat measurements. Thus, evaluations for the estimation of growth only assign those plots that are repeat measurement plots to strata, and do not include one-time measurement plots.

Table 4.3. Important POP_EVAL entries for Minnesota through 2006 from the FIADB

	Data item names						
	CN	RSCD	EVALID	EVAL DESCR	STATECD	LOCATION NM	REPORT YEAR NM
Data item values	107106457010661	23	277701	MINNESOTA 1977: CURRENT AREA (PERIODIC)	27	Minnesota	1977
	107106458010661	23	277702	MINNESOTA 1977: CURRENT VOLUME (PERIODIC)	27	Minnesota	1977
	107106459010661	23	277703	MINNESOTA 1977: GROWTH (PERIODIC)	27	Minnesota	1977
	107106460010661	23	277704	MINNESOTA 1977: MORTALITY (PERIODIC)	27	Minnesota	1977
	107106461010661	23	277705	MINNESOTA 1977: REMOVALS (PERIODIC)	27	Minnesota	1977
	107106462010661	23	279001	MINNESOTA 1990: CURRENT AREA (PERIODIC)	27	Minnesota	1990

	Data item names						
	CN	RSCD	EVALID	EVAL DESCR	STATECD	LOCATION NM	REPORT YEAR NM
	107106463010661	23	279002	MINNESOTA 1990: CURRENT VOLUME (PERIODIC)	27	Minnesota	1990
	107106464010661	23	279003	MINNESOTA 1990: GROWTH (PERIODIC)	27	Minnesota	1990
	107106465010661	23	279004	MINNESOTA 1990: MORTALITY (PERIODIC)	27	Minnesota	1990
	107106466010661	23	279005	MINNESOTA 1990: REMOVALS (PERIODIC)	27	Minnesota	1990
	107106467010661	23	279006	MINNESOTA 1990: CHANGE (PERIODIC)	27	Minnesota	1990
	197440375010661	23	270300	MINNESOTA 2003: 1999-2003: ALL AREA	27	Minnesota	1999;2000;2001 ; 2002;2003
	197440374010661	23	270301	MINNESOTA 2003: 1999-2003: CURRENT AREA, CURRENT VOLUME	27	Minnesota	1999;2000;2001 ; 2002;2003
	197440569010661	23	270302	MINNESOTA 2003: 1990 TO 1999-2003: GROWTH, REMOVALS, MORTALITY	27	Minnesota	1999;2000;2001 ; 2002;2003
	197440972010661	23	270400	MINNESOTA 2004: 2000-2004: ALL AREA	27	Minnesota	2000;2001;2002 ; 2003;2004
	197440975010661	23	270401	MINNESOTA 2004: 2000-2004: CURRENT AREA, CURRENT VOLUME	27	Minnesota	2000;2001;2002 ; 2003;2004
	197441166010661	23	270500	MINNESOTA 2005: 2001-2005: ALL AREA	27	Minnesota	2001;2002;2003 ; 2004;2005
	197441167010661	23	270501	MINNESOTA 2005: 2001-2005: CURRENT AREA, CURRENT VOLUME	27	Minnesota	2001;2002;2003 ; 2004;2005
	197441358010661	23	270600	MINNESOTA 2006: 2002-2006: ALL AREA	27	Minnesota	2002;2003;2004 ; 2005;2006
	197441359010661	23	270601	MINNESOTA 2006: 2002-2006: CURRENT AREA, CURRENT VOLUME	27	Minnesota	2002;2003;2004 ; 2005;2006
	192738219010661	23	270700	MINNESOTA 2007: 2003-2007: ALL AREA	27	Minnesota	2003;2004;2005 ;2006;2007
	192738225010661	23	270701	MINNESOTA 2007: 2003-2007: CURRENT AREA, CURRENT VOLUME	27	Minnesota	2003;2004;2005 ;2006;2007
	197440976010661	23	270402	MINNESOTA 2004: 1999 TO 2004: GROWTH, REMOVALS, MORTALITY	27	Minnesota	2004
	197441170010661	23	270502	MINNESOTA 2005: 1999-2000 TO 2004-2005: GROWTH, REMOVALS, MORTALITY	27	Minnesota	2004;2005
	197441539010661	23	270602	MINNESOTA 2006: 1999-2001 TO 2004-2006: GROWTH, REMOVALS, MORTALITY	27	Minnesota	2004;2005;2006

An evaluation group is the set of evaluations that goes into the contents of a typical FIA report for a State. For example the evaluations that went into the report entitled “Minnesota’s forests 1999-2003 (Part A.)” (Miles and others 2007) are identified by EVALIDs 270300, 270301 and 270302, and are collectively identified by a single record in the POP_EVAL_GRP table. Table 4.4 lists the important attributes for all evaluation groups that are loaded into FIADB for data collected in Minnesota through 2006.

Table 4.4. Important POP_EVAL_GRP entries for Minnesota through 2006 from the FIADB

CN	RSCD	EVAL_GRP	EVAL_GRP_DESCR	STATECD
107114016010661	23	271977	MINNESOTA 1977: CURRENT AREA, CURRENT VOLUME, GROWTH, REMOVALS, MORTALITY	27
107114017010661	23	271990	MINNESOTA 1990: CURRENT AREA, CURRENT VOLUME, GROWTH, REMOVALS, MORTALITY, CHANGE	27
197441921010661	23	272003	MINNESOTA 2003: ALL AREA, CURRENT AREA, CURRENT VOLUME, GROWTH, REMOVALS, MORTALITY	27
197442818010661	23	272004	MINNESOTA 2004: ALL AREA, CURRENT AREA, CURRENT VOLUME, GROWTH, REMOVALS, MORTALITY	27
197443272010661	23	272005	MINNESOTA 2005: ALL AREA, CURRENT AREA, CURRENT VOLUME, GROWTH, REMOVALS, MORTALITY	27
197443769010661	23	272006	MINNESOTA 2006: ALL AREA, CURRENT AREA, CURRENT VOLUME, GROWTH, REMOVALS, MORTALITY	27

In the POP_EVAL_GRP table the data item EVAL_GRP identifies the evaluation group by its State code (first 2 digits) and a year (last 4 digits), which is the year commonly associated with estimates (if EVAL_GRP does not follow this format, see the EVAL_GRP_DESCR for the precise identification). In table 4.4 we see evaluation groups for two periodic inventory estimates (1977 and 1990), and four annual estimates (2003, 2004, 2005 and 2006). The EVAL_GRP_DESCR describes the groups, and indicates that all of the annual inventory estimates are based on 5 years of measurements taken over the 5-year period ending with that date.

The POP_EVAL_TYP table provides a link between the evaluation groups in POP_EVAL_GRP and the evaluations in POP_EVAL. POP_EVAL_TYP.EVAL_TYP identifies the evaluation type - “EXPCURR,” “EXPVOL,” “EXPDWM,” “EXPGROW,” “EXPMORT,” “EXPREMV,” or “EXPALL” - that can be estimated from a specific evaluation. “EXPCURR” identifies the evaluation used in the estimation of most area estimates, such as the area of forest land or the area of timberland, as well as condition-level estimates, such as modeled total carbon . “EXPDWM” identifies the evaluation used in the estimation of down woody material attributes. “EXPVOL” identifies the evaluation used in the estimation of tree-level attributes such as number, volume, and biomass of trees, and seedling-level estimates, such as number of seedlings. “EXPGROW,” “EXPMORT,” and “EXPREMV” identify the evaluations used in the estimation of growth, mortality, and removals, respectively. The evaluation identified by “EXPALL” is only appropriate for area estimation where the area of hazardous and denied access are of interest. All other evaluations treat hazardous and denied access as non-measured and adjust the estimate to account for these areas.

The POP_EVAL_TYP table allows users to query the appropriate evaluation by identifying only the eval_grp (STATECD*10000 + INV_YR) and evaluation type (EVAL_TYP) and allows for a variety of evaluations to be added in the future. In the example below, the join selects the appropriate evaluation for the estimation of area and volume attributes for the Minnesota 2003 annual inventory.

```
SELECT pev.cn, pev.eval_descr
  FROM pop_eval_typ pet, pop_eval pev, pop_eval_grp peg
 WHERE peg.eval_grp = 272003
   AND peg.cn = pet.eval_grp_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_typ = 'EXPCURR';
```

This is a change from previous FIADB versions whereby evaluations were identified by columns in the POP_EVAL_GRP table. These columns have been dropped for version 5.1 (see "Changes From the Previous Database Version" in Chapter 1). Thus, the following query will no longer work:

```
select pev.cn, pev.eval_descr
from pop_eval pev, pop_eval_grp peg
where  peg.eval_grp = 272003 and
          pev.cn = peg.eval_cn_for_expcurr
```

3. Linking the appropriate tables in FIADB to produce estimates of attributes of interest for a population

The following Oracle™ SQL script can be modified to produce an estimate of any condition-, tree-, or seedling-level attribute listed in the REF_POP_ATTRIBUTE table. In this standard script (example 4.1), the non-bold text applies to all estimates and the bold text is modified by the user, depending on the desired attribute of interest and evaluation group. The line numbers have been added for reference. On line 01, the text in the column EXPRESSION in the REF_POP_ATTRIBUTE table associated with the desired attribute of interest should be inserted. Lines 05 or 06 include either the TREE table or SEEDLING table, and neither line should be included for condition-level estimates. Line 05 should be included for tree-level estimates and line 06 should be included for seedling-level estimates. On line 14, the additions to the SQL where clause from the WHERE_CLAUSE column of the REF_POP_ATTRIBUTE table for the desired attribute of interest should be inserted. Finally, on line 21, the desired evaluation group needs to be indicated by replacing the characters SSYYYY with the desired evaluation group, whereby SS = STATECD of the desired State, and YYYY = year of the desired inventory (if EVAL_GRP does not follow this format, see the EVAL_GRP_DESCR for the precise identification). With these changes, a user can produce the standard estimates for any desired population from the REF_POP_ATTRIBUTE table.

Estimation requires linking the attribute values (on the COND, TREE, and SEEDLING tables) to the stratification information (on the POP_PLOT_STRATUM_ASSGN, POP_STRATUM, and POP_ESTN_UNIT) for the selected evaluation that defines the sample. Those links are provided in lines 15 thru 20 of the script, and these lines do not change. Line 15 links the POP_PLOT_STRATUM_ASSGN record to the plot record. Line 16 links the POP_PLOT_STRATUM_ASSGN record to the POP_STRATUM (which identifies each stratum in the estimation unit and contains EXPNS, the plot expansion factor or acres assigned to the plot, PSM.EXPNS=(PEU.AREA_USED*PSM.P1POINTCNT / PEU.P1PNTCNT_EU / PSM.P2POINTCNT). Line 17 links the POP_ESTN_UNIT (which

identifies each estimation unit in the evaluation) to the POP_ STRATUM record. Line 18 links the POP_EVAL, which identifies each evaluation, to the specific evaluation that is required for the estimation. Lines 19 and 20 link the appropriate evaluation to the attribute and evaluation group for which the estimate is being made. See figure 7 for a schematic of links of some of the FIADB tables.

The following table shows some common aliases or abbreviations used within a SQL script to reduce the overall length of the script and improve readability.

Common aliases for FIADB tables

Alias	Table name
p	PLOT
c	COND
t	TREE
s	SEEDLING
ppsa	POP_PLOT_STRATUM_ASSGN
psm	POP_STRATUM
peu	POP_ESTN_UNIT
pet	POP_EVAL_TYP
peg	POP_EVAL_GRP
pev	POP_EVAL
rs	REF_SPECIES

Example 4.1. Standard estimation script

```
01  SELECT SUM(psm.expns * EXPRESSION -- insert ref_pop_attribute EXPRESSION here
02           ) estimate
03    FROM cond                    c,
04         plot                    p,
05         tree                    t, -- tree table must be included for tree-level estimates
06         seedling                s, -- seedling table must be included for seedling-level estimate
07         pop_plot_stratum_assgn ppsa,
08         pop_stratum             psm,
09         pop_estn_unit           peu,
10         pop_eval                pev,
11         pop_eval_typ            pet,
12         pop_eval_grp            peg
13   WHERE p.cn = c.plt_cn
14     WHERE_CLAUSE -- insert ref_pop_attribute WHERE_CLAUSE here
15     AND ppsa.plt_cn = p.cn
16     AND ppsa.stratum_cn = psm.cn
17     AND peu.cn = psm.estn_unit_cn
18     AND pev.cn = peu.eval_cn
19     AND pev.cn = pet.eval_cn
20     AND pet.eval_grp_cn = peg.cn
21     AND peg.eval_grp = SSYYYY -- the desired evaluation group must be specified
```

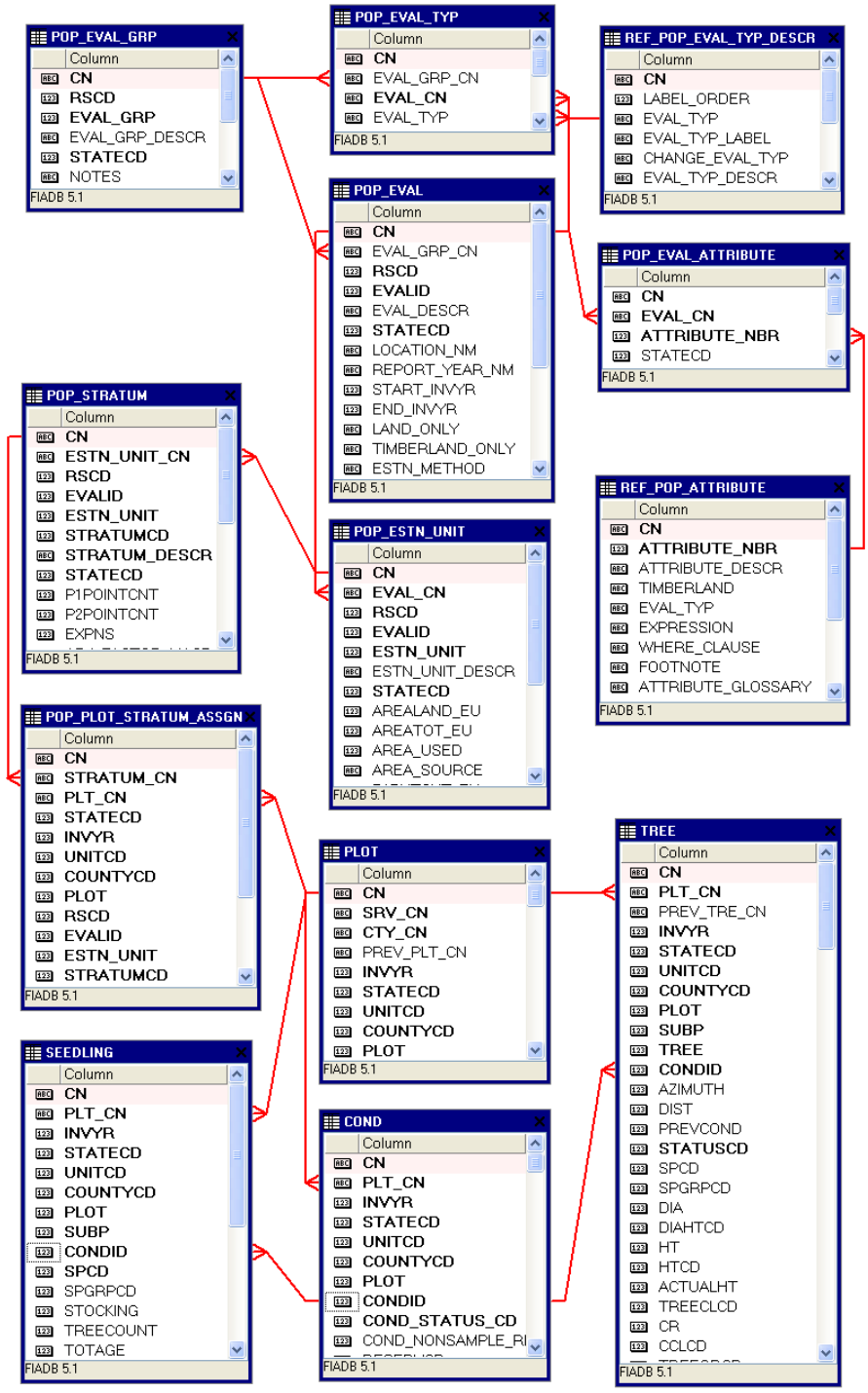


Figure 7. An abbreviated diagram of select FIADB tables. Note that there are more columns in each table than are shown.

In the following four examples (4.2, 4.3, 4.4, and 4.5), the scripts are modified from above to produce condition-, tree-, and seedling-level estimates for the Minnesota 2003 inventory. Here the sections in bold are the sections that changed from the standard estimation script, e.g., the REF_POP_ATTRIBUTE.EXPRESSION and REF_POP_ATTRIBUTE.WHERE_CLAUSE have been inserted, along with the chosen evaluation number.

Note: The resulting estimates shown as output are examples only and are not necessarily the exact numbers a user will obtain using current data.

Example 4.2 Estimate area of timberland (acres)

```
SELECT SUM(psm.expns * c.condprop_unadj *
        decode(c.prop_basis,
             'MACR',
             psm.adj_factor_macr,
             psm.adj_factor_subp) -- this is the expression from ref_pop_attribute table
        ) estimate
  FROM cond                      c,
       plot                      p,
       pop_plot_stratum_assgn  ppsa,
       pop_stratum              psm,
       pop_estn_unit            peu,
       pop_eval                 pev,
       pop_eval_typ             pet,
       pop_eval_grp             peg
 WHERE p.cn = c.plt_cn
   AND pet.eval_typ = 'EXPCURR'
   AND c.cond_status_cd = 1
   AND c.reservcd = 0
   AND c.siteclcd IN (1, 2, 3, 4, 5, 6) -- this is the where_clause from ref_pop_attribute table
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
```

Produces the following estimate of acres of timberland:

ESTIMATE
14,743,614

Example 4.3 Estimate number of live trees on forest land (trees)

```
SELECT SUM(psm.expns * t.tpa_unadj *
      decode(dia,
           null,
           psm.adj_factor_subp,
           decode(least(t.dia, 5 - 0.001),
                t.dia,
                psm.adj_factor_micr,
                decode(least(t.dia,
                          nvl(p.macro_breakpoint_dia, 9999) - 0.001),
                     t.dia,
                     psm.adj_factor_subp,
                     psm.adj_factor_macr))) -- this is the expression from ref_pop_attribute table
      ) estimate
 FROM cond                      c,
     plot                       p,
     tree                       t, -- tree table must be included for tree-level estimates
     pop_plot_stratum_assgn ppsa,
     pop_stratum                psm,
     pop_estn_unit              peu,
     pop_eval                   pev,
     pop_eval_typ               pet,
     pop_eval_grp               peg
 WHERE p.cn = c.plt_cn
   AND pet.eval_typ = 'EXPVOL'
   AND t.plt_cn = c.plt_cn
   AND t.condid = c.condid
   AND c.cond_status_cd = 1
   AND t.statuscd = 1
   AND t.dia >= 1.0 -- additional where_clause from ref_pop_attribute table
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
```

Produces the following estimate of total number of live trees on forest land:

ESTIMATE
12,078,196,211

Example 4.4 Estimate number of live seedlings on timberland (seedlings)

```
SELECT SUM(psm.expns * s.tpa_unadj * psm.adj_factor_micr -- expression from ref_pop_attribute table
        ) estimate
  FROM cond                    c,
       plot                    p,
       seedling                s, -- seedling table must be included for seedling-level estimates
       pop_plot_stratum_assgn ppsa,
       pop_stratum             psm,
       pop_estn_unit           peu,
       pop_eval                pev,
       pop_eval_typ            pet,
       pop_eval_grp            peg
 WHERE p.cn = c.plt_cn
   AND pet.eval_typ = 'EXPVOL'
   AND s.plt_cn = c.plt_cn
   AND s.condid = c.condid
   AND c.cond_status_cd = 1
   AND c.reservcd = 0
   AND c.siteclcd IN (1, 2, 3, 4, 5, 6) -- additional where_clause from ref_pop_attribute table
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
```

Produces the following estimate of total number of live seedlings on timberland:

ESTIMATE
37,156,392,660

Example 4.5 Estimate volume of growing-stock trees on timberland (cubic feet)

```
SELECT SUM(psm.expns * t.tpa_unadj * t.volcfnet *
        decode(t.dia,
             null,
             psm.adj_factor_subp,
             decode(least(t.dia, 5 - 0.001),
                  t.dia,
                  psm.adj_factor_micr,
                  decode(least(t.dia,
                            nvl(p.macro_breakpoint_dia, 9999) - 0.001),
                       t.dia,
                       psm.adj_factor_subp,
                       psm.adj_factor_macr))) -- this is the expression from ref_pop_attribute table
        ) estimate
  FROM cond                      c,
     plot                        p,
     tree                        t, -- tree table must be included for tree-level estimates
     pop_plot_stratum_assgn ppsa,
     pop_stratum                 psm,
     pop_estn_unit               peu,
     pop_eval                    pev,
     pop_eval_typ                pet,
     pop_eval_grp                peg
 WHERE p.cn = c.plt_cn
   AND pet.eval_typ = 'EXPVOL'
   AND t.plt_cn = c.plt_cn
   AND t.condid = c.condid
   AND c.cond_status_cd = 1
   AND c.reservcd = 0
   AND c.siteclcd in (1, 2, 3, 4, 5, 6)
   AND t.statuscd = 1
   AND t.treeclcd = 2
   AND t.dia >= 5.0 -- additional where_clause from ref_pop_attribute table
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
```

Produces the following estimate of total growing-stock volume (cubic feet) on timberland:

ESTIMATE
15,247,519,938

Important Note: Users who access data from periodic inventories should restrict the estimation only to the standard timberland estimates. In most cases, for periodic inventories, the FIADB contains only condition level information on reserved and unproductive forest lands, and tree level information on timberland.

4. Producing estimates with sampling errors for attributes of interest for a population

Producing population estimates that include error estimates (sampling error or variance of the estimate) along with the estimated total is more complicated. The following Oracle™ SQL script can be used as a template in producing estimates with sampling errors. The line numbers have been added for reference. This example follows the notation used in Bechtold and Patterson (2005, equation 4.14 on page 55). Again, the portions of the script that should be changed by the user to specify the attribute of interest and population are in bold. Besides returning the estimates and sampling errors, this script also outputs the total number of plots in the sample (TOTAL_PLOTS), the number of plots where the attribute of interest was observed to occur (NON_ZERO_PLOTS), and the total population area (TOTAL_POPULATION_ACRES). This procedure produces two intermediate tables: phase_1_summary and phase_2_summary. Phase_1_summary is a stratum-level table that contains the stratification information necessary in the estimation within strata sample sizes (n_h), stratum weights (W_h), and population area (A_T). Phase_2_summary is a stratum-level table that contains a summary of the attribute of interest on per-unit-area basis (y_{hid}), including the sum and sum of the squared plot-level values and the number of plots where the attribute of interest was observed.

Example 4.6. Standard script for estimates with sampling errors

```
01  SELECT eval_grp,
02         SUM(estimate_by_estn_unit.estimate) estimate,
03         CASE
04           WHEN SUM(estimate_by_estn_unit.estimate) > 0 THEN
05            round(sqrt(SUM(estimate_by_estn_unit.var_of_estimate)) /
06                  SUM(estimate_by_estn_unit.estimate) * 100,
07                  3)
08          ELSE
09            0
10         END AS se_of_estimate_pct,
11         SUM(estimate_by_estn_unit.var_of_estimate) var_of_estimate,
12         SUM(estimate_by_estn_unit.total_plots) total_plots,
13         SUM(estimate_by_estn_unit.non_zero_plots) non_zero_plots,
14         SUM(estimate_by_estn_unit.total_population_area_acres) total_population_acres
15    FROM (SELECT pop_eval_grp_cn,
16                 eval_grp,
17                 estn_unit_cn,
18                 SUM(nvl(ysum_hd, 0) * phase_1_summary.expns) estimate,
19                 SUM(phase_1_summary.n_h) total_plots,
20                 SUM(phase_2_summary.number_plots_in_domain) domain_plots,
21                 SUM(phase_2_summary.non_zero_plots) non_zero_plots,
22                 total_area * total_area / SUM(phase_1_summary.n_h) *
23                 ((SUM(w_h * phase_1_summary.n_h *
```

```
24                  (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
25                  ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
26                  (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
27                  (phase_1_summary.n_h - 1)))) +
28              1 / SUM(phase_1_summary.n_h) *
29              (SUM((1 - w_h) * phase_1_summary.n_h *
30                  (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
31                  ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
32                  (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
33                  (phase_1_summary.n_h - 1))))) var_of_estimate,
34              total_area total_population_area_acres
35          FROM (SELECT peg.eval_grp,
36                  peg.cn pop_eval_grp_cn,
37                  psm.estn_unit_cn,
38                  psm.expns,
39                  psm.cn pop_stratum_cn,
40                  p1pointcnt /
41                  (SELECT SUM(strs.p1pointcnt)
42                    FROM pop_stratum strs
43                    WHERE strs.estn_unit_cn = psm.estn_unit_cn) w_h,
44                  (SELECT SUM(strs.p1pointcnt)
45                    FROM pop_stratum strs
46                    WHERE strs.estn_unit_cn = psm.estn_unit_cn) n_prime,
47                  p1pointcnt n_prime_h,
48                  (SELECT SUM(eu_s.area_used)
49                    FROM pop_estn_unit eu_s
50                    WHERE eu_s.cn = psm.estn_unit_cn) total_area,
51                  psm.p2pointcnt n_h
52                FROM pop_estn_unit peu,
53                  pop_stratum         psm,
54                  pop_eval            pev,
55                  pop_eval_grp        peg,
56                  pop_eval_typ        pet
57                WHERE peu.cn = psm.estn_unit_cn
58                  and pev.cn = peu.eval_cn
59                  and pet.eval_cn = pev.cn
60                  and pet.eval_grp_cn = peg.cn
61                  and pet.eval_typ = 'EXPXXX' -- specify the appropriate expansion
62                  AND peg.eval_grp = SSYYYY -- the desired evaluation group must be specified
63              ) phase_1_summary,
64              (SELECT pop_stratum_cn,
65                  SUM(y_hid_adjusted) ysum_hd,
66                  SUM(y_hid_adjusted * y_hid_adjusted) ysum_hd_sqr,
67                  COUNT(*) number_plots_in_domain,
68                  SUM(decode(y_hid_adjusted, 0, 0, NULL, 0, 1)) non_zero_plots
69                FROM (SELECT psm.cn pop_stratum_cn,
70                      p.cn plt_cn,
71                      SUM(EXPRESSION) y_hid_adjusted
                                -- the appropriate expression from ref_pop_attribute table
73                    FROM cond c,
74                      plot        p,
75                      tree        t, -- tree table must be included for tree-level estimates
76                      seedling s, -- seedling table must be included for seedling-level estimates
77                      pop_plot_stratum_assgn ppsa,
```

```
78                          pop_stratum                 psm,
79                          pop_estn_unit               peu,
80                          pop_eval                    pev,
81                          pop_eval_grp                peg,
82                          pop_eval_typ                pet
83                        WHERE p.cn = c.plt_cn
84                          WHERE_CLAUSE -- additional where_clause from ref_pop_attribute table
85                          AND ppsa.plt_cn = p.cn
86                          AND ppsa.stratum_cn = psm.cn
87                          AND peu.cn = psm.estn_unit_cn
88                          AND pev.cn = peu.eval_cn
89                          AND pet.eval_cn = pev.cn
90                          AND pet.eval_grp_cn = peg.cn
91                          AND peg.eval_grp = SSYYYY
                                    -- the desired evaluation group must be specified
92                        GROUP BY psm.cn, p.cn)
93                  GROUP BY pop_stratum_cn) phase_2_summary
94              WHERE phase_1_summary.pop_stratum_cn =
95                  phase_2_summary.pop_stratum_cn(+)
96              GROUP BY pop_eval_grp_cn,
97                    eval_grp,
98                    estn_unit_cn,
99                    phase_1_summary.total_area) estimate_by_estn_unit
100   GROUP BY pop_eval_grp_cn, eval_grp
```

In the following three examples the scripts were modified from above to produce condition-, tree-, and seedling-level estimates for the Minnesota 2003 inventory. Here the sections in bold are the sections that changed from the standard script for estimates with sampling errors.

Example 4.7. Estimate Area of timberland (acres) with sampling error (Note the bold sections in this example match the bold sections in example 4.2, which estimates the same area without sampling errors.)

```
SELECT eval_grp,
      SUM(estimate_by_estn_unit.estimate) estimate,
      CASE
        WHEN SUM(estimate_by_estn_unit.estimate) > 0 THEN
         round(sqrt(SUM(estimate_by_estn_unit.var_of_estimate)) /
              SUM(estimate_by_estn_unit.estimate) * 100,
              3)
        ELSE
         0
      END AS se_of_estimate_pct,
      SUM(estimate_by_estn_unit.var_of_estimate) var_of_estimate,
      SUM(estimate_by_estn_unit.total_plots) total_plots,
      SUM(estimate_by_estn_unit.non_zero_plots) non_zero_plots,
      SUM(estimate_by_estn_unit.total_population_area_acres) total_population_acres
  FROM (SELECT pop_eval_grp_cn,
              eval_grp,
              estn_unit_cn,
              SUM(nvl(ysum_hd, 0) * phase_1_summary.expns) estimate,
```

```
    SUM(phase_1_summary.n_h) total_plots,
    SUM(phase_2_summary.number_plots_in_domain) domain_plots,
    SUM(phase_2_summary.non_zero_plots) non_zero_plots,
    total_area * total_area / SUM(phase_1_summary.n_h) *
    ((SUM(w_h * phase_1_summary.n_h *
        (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
        ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
        (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
        (phase_1_summary.n_h - 1)))) +
    1 / SUM(phase_1_summary.n_h) *
    (SUM((1 - w_h) * phase_1_summary.n_h *
        (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
        ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
        (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
        (phase_1_summary.n_h - 1))))) var_of_estimate,
    total_area total_population_area_acres
FROM (SELECT peg.eval_grp,
          peg.cn pop_eval_grp_cn,
          psm.estn_unit_cn,
          psm.cn pop_stratum_cn,
          psm.expns,
          p1pointcnt /
          (SELECT SUM(strs.p1pointcnt)
            FROM pop_stratum strs
           WHERE strs.estn_unit_cn = psm.estn_unit_cn) w_h,
          (SELECT SUM(strs.p1pointcnt)
            FROM pop_stratum strs
           WHERE strs.estn_unit_cn = psm.estn_unit_cn) n_prime,
          p1pointcnt n_prime_h,
          (SELECT SUM(eu_s.area_used)
            FROM pop_estn_unit eu_s
           WHERE eu_s.cn = psm.estn_unit_cn) total_area,
          psm.p2pointcnt n_h
      FROM pop_estn_unit peu,
          pop_stratum         psm,
          pop_eval            pev,
          pop_eval_grp        peg,
          pop_eval_typ        pet
     WHERE peu.cn = psm.estn_unit_cn
       AND pev.cn = peu.eval_cn
       AND pet.eval_cn = pev.cn
       AND pet.eval_grp_cn = peg.cn
       AND pet.eval_typ = 'EXPCURR' -- specify the appropriate expansion
       AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
    ) phase_1_summary,
    (SELECT pop_stratum_cn,
          SUM(y_hid_adjusted) ysum_hd,
          SUM(y_hid_adjusted * y_hid_adjusted) ysum_hd_sqr,
          COUNT(*) number_plots_in_domain,
          SUM(decode(y_hid_adjusted, 0, 0, NULL, 0, 1)) non_zero_plots
      FROM (SELECT psm.cn pop_stratum_cn,
                p.cn plt_cn,
                SUM(c.condprop_unadj *
                   decode(c.prop_basis,
                        'MACR',
                        psm.adj_factor_macr,
```

```
                    psm.adj_factor_subp) -- the expression from ref_pop_attribute table
                    ) y_hid_adjusted
                FROM cond                    c,
                    plot                     p,
                    pop_plot_stratum_assgn ppsa,
                    pop_stratum              psm,
                    pop_estn_unit            peu,
                    pop_eval                 pev,
                    pop_eval_grp             peg,
                    pop_eval_typ             pet
                WHERE p.cn = c.plt_cn
                  AND pet.eval_typ = 'EXPCURR'
                  AND c.cond_status_cd = 1
                  AND c.reservcd = 0
                  AND c.siteclcd IN (1, 2, 3, 4, 5, 6)
                                -- additional where_clause from ref_pop_attribute table
                  AND ppsa.plt_cn = p.cn
                  AND ppsa.stratum_cn = psm.cn
                  AND peu.cn = psm.estn_unit_cn
                  AND pev.cn = peu.eval_cn
                 AND pet.eval_cn = pev.cn
                 AND pet.eval_grp_cn = peg.cn
                 AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
                GROUP BY psm.cn, p.cn)
            GROUP BY pop_stratum_cn) phase_2_summary
        WHERE phase_1_summary.pop_stratum_cn =
            phase_2_summary.pop_stratum_cn(+)
        GROUP BY pop_eval_grp_cn,
                eval_grp,
                estn_unit_cn,
                phase_1_summary.total_area) estimate_by_estn_unit
GROUP BY pop_eval_grp_cn, eval_grp
```

Produces the following estimate of acres of timberland with sampling error:

EVAL GRP	272003
ESTIMATE	14,743,614
SE OF ESTIMATE PCT	0.7
VAR OF ESTIMATE	10,994,899,570
TOTAL PLOTS	16041
NONZERO PLOTS	4,777
TOTAL POPULATION ACRES	54,002,539

Example 4.8. Estimate number of live trees on forest land (trees) with sampling error (Note the bold sections in this example match the bold sections in example 4.3, which estimates the same number of trees without sampling errors.)

```
SELECT eval_grp,
    SUM(estimate_by_estn_unit.estimate) estimate,
    CASE
      WHEN SUM(estimate_by_estn_unit.estimate) > 0 THEN
       round(sqrt(SUM(estimate_by_estn_unit.var_of_estimate)) /
```

```
            SUM(estimate_by_estn_unit.estimate) * 100,
            3)
        ELSE
         0
      END AS se_of_estimate_pct,
      SUM(estimate_by_estn_unit.var_of_estimate) var_of_estimate,
      SUM(estimate_by_estn_unit.total_plots) total_plots,
      SUM(estimate_by_estn_unit.non_zero_plots) non_zero_plots,
      SUM(estimate_by_estn_unit.total_population_area_acres) total_population_acres
  FROM (SELECT pop_eval_grp_cn,
            eval_grp,
            estn_unit_cn,
            sum(nvl(ysum_hd, 0) * phase_1_summary.expns) estimate,
            SUM(phase_1_summary.n_h) total_plots,
            SUM(phase_2_summary.number_plots_in_domain) domain_plots,
            SUM(phase_2_summary.non_zero_plots) non_zero_plots,
            total_area * total_area / SUM(phase_1_summary.n_h) *
            ((SUM(w_h * phase_1_summary.n_h *
                (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
                ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
                (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
                (phase_1_summary.n_h - 1)))) +
            1 / SUM(phase_1_summary.n_h) *
            (SUM((1 - w_h) * phase_1_summary.n_h *
                (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
                ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
                (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
                (phase_1_summary.n_h - 1))))) var_of_estimate,
            total_area total_population_area_acres
        FROM (SELECT peg.eval_grp,
                  peg.cn pop_eval_grp_cn,
                  psm.estn_unit_cn,
                  psm.expns,
                  psm.cn pop_stratum_cn,
                  p1pointcnt /
                  (SELECT SUM(strs.p1pointcnt)
                     FROM pop_stratum strs
                    WHERE strs.estn_unit_cn = psm.estn_unit_cn) w_h,
                  (SELECT SUM(strs.p1pointcnt)
                     FROM pop_stratum strs
                    WHERE strs.estn_unit_cn = psm.estn_unit_cn) n_prime,
                  p1pointcnt n_prime_h,
                  (SELECT SUM(eu_s.area_used)
                     FROM pop_estn_unit eu_s
                    WHERE eu_s.cn = psm.estn_unit_cn) total_area,
                  psm.p2pointcnt n_h
              FROM pop_estn_unit peu,
                  pop_stratum         psm,
                  pop_eval            pev,
                  pop_eval_grp        peg,
                  pop_eval_typ        pet
             WHERE peu.cn = psm.estn_unit_cn
               AND pev.cn = peu.eval_cn
               AND pet.eval_cn = pev.cn
               AND pet.eval_grp_cn = peg.cn
               AND pet.eval_typ = 'EXP'||'VOL' -- specify the appropriate expansion
```

```
        AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
      ) phase_1_summary,
      (SELECT pop_stratum_cn,
          SUM(y_hid_adjusted) ysum_hd,
          SUM(y_hid_adjusted * y_hid_adjusted) ysum_hd_sqr,
          COUNT(*) number_plots_in_domain,
          SUM(decode(y_hid_adjusted, 0, 0, NULL, 0, 1)) non_zero_plots
        FROM (SELECT psm.cn pop_stratum_cn,
              p.cn plt_cn,
              SUM(t.tpa_unadj *
                 decode(t.dia,
                      NULL,
                      psm.adj_factor_subp,
                      decode(least(t.dia, 5 - 0.001),
                           t.dia,
                           psm.adj_factor_micr,
                           decode(least(t.dia,
                                  nvl(p.macro_breakpoint_dia,
                                    9999) - 0.001),
                                t.dia,
                                psm.adj_factor_subp,
                                psm.adj_factor_macr))) -- expression from ref_pop_attribute
                                                          table
                  ) y_hid_adjusted
             FROM cond                  c,
                  plot                  p,
                  tree                  t, -- tree table must be included for tree-level estimates
                  pop_plot_stratum_assgn ppsa,
                  pop_stratum           psm,
                  pop_estn_unit         peu,
                  pop_eval              pev,
                  pop_eval_grp          peg,
                  pop_eval_typ          pet
            WHERE p.cn = c.plt_cn
              AND pet.eval_typ = 'EXPVOL'
              AND t.plt_cn = c.plt_cn
              AND t.condid = c.condid
              AND c.cond_status_cd = 1
              AND t.statuscd = 1
              AND t.dia >= 1.0 -- additional where_clause from ref_pop_attribute table
              AND ppsa.plt_cn = p.cn
              AND ppsa.stratum_cn = psm.cn
              AND peu.cn = psm.estn_unit_cn
              AND pev.cn = peu.eval_cn
              AND pet.eval_cn = pev.cn
              AND pet.eval_grp_cn = peg.cn
              AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
            GROUP BY psm.cn, p.cn)
       GROUP BY pop_stratum_cn) phase_2_summary
    WHERE phase_1_summary.pop_stratum_cn =
        phase_2_summary.pop_stratum_cn(+)
    GROUP BY pop_eval_grp_cn,
          eval_grp,
          estn_unit_cn,
          phase_1_summary.total_area) estimate_by_estn_unit
GROUP BY pop_eval_grp_cn, eval_grp
```

Produces the following estimate of number of live trees on forest land with sampling error:

EVAL GRP	272003
ESTIMATE	12,078,196,211
SE OF ESTIMATE PCT	1.3
VAR OF ESTIMATE	25,846,103,844,454,600
TOTAL PLOTS	16,041
NONZERO PLOTS	5,069
TOTAL POPULATION ACRES	54,002,539

Example 4.9. Estimate number of seedlings on timberland (seedlings) with sampling error

```
SELECT eval_grp,
      SUM(estimate_by_estn_unit.estimate) estimate,
      CASE
        WHEN SUM(estimate_by_estn_unit.estimate) > 0 THEN
         round(sqrt(SUM(estimate_by_estn_unit.var_of_estimate)) /
              SUM(estimate_by_estn_unit.estimate) * 100,
              3)
        ELSE
         0
      END AS se_of_estimate_pct,
      SUM(estimate_by_estn_unit.var_of_estimate) var_of_estimate,
      SUM(estimate_by_estn_unit.total_plots) total_plots,
      SUM(estimate_by_estn_unit.non_zero_plots) non_zero_plots,
      SUM(estimate_by_estn_unit.total_population_area_acres) total_population_acres
  FROM (SELECT pop_eval_grp_cn,
              eval_grp,
              estn_unit_cn,
              sum(nvl(ysum_hd, 0) * phase_1_summary.expns) estimate,
              SUM(phase_1_summary.n_h) total_plots,
              SUM(phase_2_summary.number_plots_in_domain) domain_plots,
              SUM(phase_2_summary.non_zero_plots) non_zero_plots,
              total_area * total_area / SUM(phase_1_summary.n_h) *
              ((SUM(w_h * phase_1_summary.n_h *
                   (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
                   ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
                   (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
                   (phase_1_summary.n_h - 1)))) +
              1 / SUM(phase_1_summary.n_h) *
              (SUM((1 - w_h) * phase_1_summary.n_h *
                   (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
                   ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
                   (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
                   (phase_1_summary.n_h - 1))))) var_of_estimate,
              total_area total_population_area_acres
         FROM (SELECT peg.eval_grp,
                      peg.cn pop_eval_grp_cn,
                      psm.estn_unit_cn,
                      psm.expns,
```

```
       psm.cn pop_stratum_cn,
       p1pointcnt /
       (SELECT SUM(strs.p1pointcnt)
          FROM pop_stratum strs
         WHERE strs.estn_unit_cn = psm.estn_unit_cn) w_h,
       (SELECT SUM(strs.p1pointcnt)
          FROM pop_stratum strs
         WHERE strs.estn_unit_cn = psm.estn_unit_cn) n_prime,
       p1pointcnt n_prime_h,
       (SELECT SUM(eu_s.area_used)
          FROM pop_estn_unit eu_s
         WHERE eu_s.cn = psm.estn_unit_cn) total_area,
       psm.p2pointcnt n_h
  FROM pop_estn_unit peu,
       pop_stratum         psm,
       pop_eval            pev,
       pop_eval_grp        peg,
       pop_eval_typ        pet
 WHERE peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pet.eval_cn = pev.cn
   AND pet.eval_grp_cn = peg.cn
   AND pet.eval_typ = 'EXP'VOL' -- specify the appropriate expansion
   AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
) phase_1_summary,
(SELECT pop_stratum_cn,
       SUM(y_hid_adjusted) ysum_hd,
       SUM(y_hid_adjusted * y_hid_adjusted) ysum_hd_sqr,
       COUNT(*) number_plots_in_domain,
       SUM(decode(y_hid_adjusted, 0, 0, NULL, 0, 1)) non_zero_plots
  FROM (SELECT psm.cn pop_stratum_cn,
               p.cn plt_cn,
               SUM(s.tpa_unadj * psm.adj_factor_micr) y_hid_adjusted
                                                  -- expression from ref_pop_attribute table
          FROM cond                    c,
               plot                    p,
               seedling                s,
                                  -- seedling table must be included for seedling-level estimates
               pop_plot_stratum_assgn ppsa,
               pop_stratum             psm,
               pop_estn_unit           peu,
               pop_eval                pev,
               pop_eval_grp            peg,
               pop_eval_typ            pet
         WHERE p.cn = c.plt_cn
           AND pet.eval_typ = 'EXPVOL'
           AND s.plt_cn = c.plt_cn
           AND s.condid = c.condid
           AND c.cond_status_cd = 1
           AND c.reservcd = 0
           AND c.siteclcd IN (1, 2, 3, 4, 5, 6)
                              -- additional where_clause from ref_pop_attribute table
           AND ppsa.plt_cn = p.cn
           AND ppsa.stratum_cn = psm.cn
           AND peu.cn = psm.estn_unit_cn
           AND pev.cn = peu.eval_cn
```

```
                    AND pet.eval_cn = pev.cn
                    AND pet.eval_grp_cn = peg.cn
                    AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
                  GROUP BY psm.cn, p.cn)
          GROUP BY pop_stratum_cn) phase_2_summary
      WHERE phase_1_summary.pop_stratum_cn =
          phase_2_summary.pop_stratum_cn(+)
      GROUP BY pop_eval_grp_cn,
            eval_grp,
            estn_unit_cn,
            phase_1_summary.total_area) estimate_by_estn_unit
GROUP BY pop_eval_grp_cn, eval_grp
```

Produces the following estimate of number of live seedlings on timberland with sampling error:

EVAL GRP	272003
ESTIMATE	37,156,392,660
SE OF ESTIMATE PCT	1.8
VAR OF ESTIMATE	455,618,564,629,222,000
TOTAL PLOTS	16,041
NONZERO PLOTS	4,307
TOTAL POPULATION ACRES	54,002,539

5. Restricting the attribute of interest to a smaller subset of the population

The estimation procedures presented in examples 4.1 through 4.9 can all be modified to restrict the estimation to a subset, referred to as the domain of interest. An example of a domain would be only sawtimber stands on publicly owned timberland. In effect, the attributes identified in the REF_POP_ATTRIBUTE table are a combination of an attribute (e.g., area, number of trees, volume, number of seedlings) and a domain (e.g., forest land, timberland, ownership, growing-stock trees). The attribute of interest is defined in the REF_POP_ATTRIBUTE.EXPRESSION and the domain of interest is defined by REF_POP_ATTRIBUTE.WHERE_CLAUSE. In example 4.2, the attribute of interest is area, and the domain of interest is restricted to timberland only. In example 4.3, the attribute of interest is number of trees, and the domain of interest is restricted to live trees on forest land with diameters 1 inch and larger. In example 4.4, the attribute of interest is number of seedlings, and the domain of interest is restricted to timberland. In example 4.5, the attribute of interest is volume of growing-stock trees, and the domain of interest is restricted to timberland.

A word of caution when working with periodic data – not all lands and all attributes were sampled in periodic inventories. In some States, only productive, non-reserved lands were sampled in periodic inventories. So, applying estimation of number of trees to all forest land in older periodic inventories will appear to work, but trees were only measured on timberland, so the estimates will only reflect the trees on timberland. Also, in many periodic inventories, seedlings were not tallied.

In the next example, the domain of interest in example 4.3 is further restricted to a specific species (SPCD = 129, eastern white pine), diameter (DIA ≥20, trees 20 inches and larger), and ownership (OWNGRPCD = 40, private owners only). The boxed lines have been added to the procedure. The procedure now provides an estimate of the total number of live eastern white pine, 20 inches and larger on privately owned forest land.

Example 4.10 Estimate number of live eastern white pine trees 20 inches and larger on privately owned forest land (trees)

```
SELECT SUM(psm.expns * t.tpa_unadj *
        decode(t.dia,
             NULL,
             psm.adj_factor_subp,
             decode(least(t.dia, 5 - 0.001),
                  t.dia,
                  psm.adj_factor_micr,
                  decode(least(t.dia,
                            nvl(p.macro_breakpoint_dia, 9999) - 0.001),
                       t.dia,
                       psm.adj_factor_subp,
                      psm.adj_factor_macr))) estimate -- expression from ref_pop_attribute table
  FROM cond                      c,
     plot                        p,
     tree                        t, -- tree table must be included for tree-level estimates
     pop_plot_stratum_assgn ppsa,
     pop_stratum                psm,
     pop_estn_unit              peu,
     pop_eval                   pev,
     pop_eval_grp               peg,
     pop_eval_typ               pet
 WHERE p.cn = c.plt_cn
   AND pet.eval_typ = 'EXPVOL'
   AND t.plt_cn = c.plt_cn
   AND t.condid = c.condid
   AND c.cond_status_cd = 1
  AND t.statuscd = 1
  AND t.dia >= 1.0 -- additional where_clause from ref_pop_attribute table
  AND t.spcd = 129
  AND t.dia >= 20.0
  AND c.owngrpcd = 40 -- user-defined additional where_clause
  AND ppsa.plt_cn = p.cn
  AND ppsa.stratum_cn = psm.cn
  AND peu.cn = psm.estn_unit_cn
  AND pev.cn = peu.eval_cn
  AND pev.cn = pet.eval_cn
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
```

Produces the following estimate of total number of live eastern white pine, 20 inches and larger on privately owned forest land:

ESTIMATE
519,317

Adding the same restrictions to the where clause in example 4.8 provides the following output:

EVAL GRP	272003
ESTIMATE	519,317
SE OF ESTIMATE PCT	25.1
VAR OF ESTIMATE	17,051,491,226
TOTAL PLOTS	16,041
NONZERO PLOTS	20
TOTAL POPULATION ACRES	54,002,539

The estimated 519,317 eastern white pine trees, 20 inches and larger on privately owned forest land has a sample error of 25.1 percent. Live eastern white pine 20 inches or larger on private forest land were observed on a total of 20 plots in the State.

6. Changing the attribute of interest with user-defined criteria

Users can define condition level attributes of interest. The standard condition level attributes of interest are sampled land area and all land area (expressed in acres). Sampled land area (adjusted for denied access and hazardous conditions that were not sampled) is the one used for nearly all standard FIA tables that report area estimates. All land area (where denied access and hazardous are considered part of the sample) is only used in estimation that treats denied access (plots on land where field crews were unable to obtain the owner's permission to measure the plot) and hazardous (conditions that were deemed too hazardous to measure the plots) as part of the sample attribute of interest. Most of the other condition level variables that FIA observes are typically used to categorize the condition, and are most often applied as restrictions on the population in defining the domain, and do not lend themselves as an attribute of interest. For example, BALIVE (the basal area of live trees 1 inch diameter and larger) is mainly used to categorize forest land area rather than as an attribute of interest in population level estimation. Users are more interested in knowing how many acres of forest land meets some basal area requirement (say between 50 and 100 square feet per acre), rather than the total basal area of forest land in a State.

An example of a user-defined condition level attribute of interest, for which an estimate of a total might be of interest, would be total land value (see Example 4.11). Here the user would supply a function that assigns value ($ per acre) to forest land, based on attributes in FIADB. As an example, we use a very arbitrary function of site index and basal area of live tree – value per acre = 1000 + (site index x 3) + (basal area x 4), and limit the domain of interest to only private timberland. Modifying example 1 produces the following script and estimate of total value. Since the function is a condition level value per acre, it is simply included in the expression as a multiplication factor, and the domain restriction (private timberland) is added

to the where clause. The sections that have been added to example 4.2 are in boxes. The same modifications were added to example 4.7 to produce the estimates with sampling errors.

Example 4.11 Estimated dollar value of private timberland (user defined function)

```
SELECT SUM(psm.expns * c.condprop_unadj *
        decode(c.prop_basis,
             'MACR',
             psm.adj_factor_macr,
             psm.adj_factor_subp) -- expression from ref_pop_attribute table
        * (1000 + c.sicond * 3 + c.balive * 4) -- user-defined value function
        ) estimate
  FROM cond                    c,
       plot                    p,
       pop_plot_stratum_assgn ppsa,
       pop_stratum             psm,
       pop_estn_unit           peu,
       pop_eval                pev,
       pop_eval_grp            peg,
       pop_eval_typ            pet
 WHERE p.cn = c.plt_cn
   AND pet.eval_typ = 'EXPCURR'
   AND c.cond_status_cd = 1
   AND c.reservcd = 0
   AND c.siteclcd IN (1, 2, 3, 4, 5, 6) -- additional where_clause from ref_pop_attribute table
   AND c.owngrpcd = 40 -- user-defined additional where_clause
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272003 -- the desired evaluation group must be specified
```

Produces the following estimate only from above example:

ESTIMATE
10,239,363,456

And the same modification to example 4.7 produces the following estimate with sampling errors:

EVAL_GRP	272003
ESTIMATE	10,239,363,456
SE_OF_ESTIMATE_PCT	1.3
VAR_OF_ESTIMATE	18,665,387,184,794,800
TOTAL_PLOTS	16,041
NON_ZERO_PLOTS	2,306
TOTAL_POPULATION_ACRES	54,002,539

Based on this function, the estimated total value of private timberland in the State is 10.2 billion dollars. This value function is used only as an example, any type of user defined function that assigns quantities, such as value ($ per acre), wildlife population level (animals per acre), productivity (yield per acre), or carbon sequestration potential (tons per acre) could be used as long as it is a function of data items in the FIADB, and/or data attributes from other sources that can be linked to FIA plots.

7. Estimates of change over time on the standard 4-subplot fixed-area plot

A number of the attributes described in the REF_POP_ATTRIBUTE table are related to change over time and are based on computed attributes that utilize data from two points in time from the same plot. The attributes identified by values 25-44 (e.g., attribute number 25, "Average annual net growth of live trees (at least 5 inches d.b.h./d.r.c.), in cubic feet, on forest land") of REF_POP_ATTRIBUTE.ATTRIBUTE_NBR are the standard net growth, removals and mortality attributes that FIA presents in its reports. The computation of these values as presented in the previous section will provide estimates of these change attributes; estimation of mortality and removals is done through the observations made and recorded at the second measurement (time 2) of the plot, estimates of net growth may utilize the time 2 or time 1 classifications of the plot, or both combined (accounting method). Users often want to do one of the following (1) obtain estimates that reflect changes in attributes over the remeasurement of the plot that go beyond these attributes, (2) classify these standard estimates and other estimates by attributes from the previous measurement, or (3) cross-classify them by changes in various attributes over time. Examples of these types of estimations are:

- Breakdowns of change in area over time by past and current land use, forest type, or other condition attributes.
- Number of trees on forest land that changed to nonforest land.
- Removals of trees on forest land of a specific forest type that changed to a different forest type.
- Mortality of trees that were in a specific diameter range in the previous measurement.

- Change in the number of seedlings per acre over time for a specific forest type.

The estimation of these and many other change attributes require properly selecting the appropriate set of plots that were measured at both points in time and linking data from these two measurements.

Prior to 1999, FIA used periodic inventories with different plot designs. Since 1999, the new annual inventory uses a national standard, 4-subplot fixed-area plot design. The change estimation procedures described here are applicable to all plots measured at least twice in the annual inventory, but may not be appropriate for change estimation between periodic and annual inventories.

7.1 Selecting an appropriate set of plots (evaluation) for change estimations

For change estimation, select an evaluation that is available for net growth, removals, and mortality estimates. These evaluations are generally available for periodic-to-periodic, periodic-to-annual, as well as annual-to-annual remeasurement plots. Area change estimates are only available on annual-to-annual remeasurement plots.

The net growth-removals-mortality (GRM) evaluations can be identified by including one of the following restrictions in the where clause.

The following statement will restrict the sample plots to only those used in the estimation of net growth:

and pop_eval_typ.eval_typ = 'EXPGROW'

The following statement will restrict the sample plots to only those used in the estimation of removals:

and pop_eval_typ.eval_typ = 'EXPREMV'

The following statement will restrict the sample plots to only those used in the estimation of mortality:

and pop_eval_typ.eval_typ = 'EXPMORT'

Area change evaluations are only available for annual-to-annual remeasurement plots as identified in the following statement:

and pop_eval_typ.eval_typ = 'EXPCHNG'

7.2 Linking tree level data to past condition data

In the following example, we demonstrate how FIA produced a tree-level net growth estimate prior to FIADB 5.1.04.

The 2012 Minnesota evaluation used in this estimate (POP_EVAL.EVALID = 271203) consists of plots measured in 2003, 2004, 2005, 2006 and 2007 that were remeasured in 2008, 2009, 2010, 2011 and 2012, respectively.

Example 4.12 Estimate net growth of live trees on forest land using traditional script (cubic feet per year)

```
SELECT SUM(psm.expns * t.tpagrow_unadj * t.fgrowcfal *
        decode(t.dia,
              null,
              psm.adj_factor_subp,
              decode(least(t.dia, 5 - 0.001),
                    t.dia,
                    psm.adj_factor_micr,
                    decode(least(t.dia,
                                nvl(p.macro_breakpoint_dia, 9999) - 0.001),
                          t.dia,
                          psm.adj_factor_subp,
                          psm.adj_factor_macr)))) estimate_traditional
 FROM cond                       c,
     plot                        p,
     tree                        t,
     pop_plot_stratum_assgn ppsa,
     pop_stratum                 psm,
     pop_estn_unit               peu,
     pop_eval                    pev,
     pop_eval_grp                peg,
     pop_eval_typ                pet
WHERE p.cn = c.plt_cn
  AND pet.eval_typ = 'EXPGROW'
  AND t.plt_cn = c.plt_cn
  AND t.condid = c.condid
  AND ppsa.plt_cn = p.cn
  AND ppsa.stratum_cn = psm.cn
  AND peu.cn = psm.estn_unit_cn
  AND pev.cn = peu.eval_cn
  AND pev.cn = pet.eval_cn
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272012 -- the desired evaluation group must be specified
```

The example above produces the following estimate of total net growth of live trees on forest land (cubic feet per year):

ESTIMATE_TRADITIONAL
391,709,742

There are two known issues with this script. One is how the subplot type (microplot, subplot, or macroplot) of each tree is determined. The subplot type is needed to apply the appropriate adjustment factor that compensates for nonsampled area. This script uses the TREE.DIA value to determine the subplot type. While this is valid for current estimates such as volume, it is not valid for remeasurement estimates for two reasons. First, TREE.DIA is not always populated on removal and mortality trees. Second, on remeasurement plots, the correctly applied subplot type is not directly related to tree diameter at time 2. For example, on removal and mortality trees, the tree remeasurement expansion factor is based on the previous plot type, which could be the microplot, not the subplot.

The other issue is that the trees per acre (TPAGROW_UNADJ) value represented by a sample tree can be different depending on the land basis. This occurs on trees that were previously 1.0-4.9 inches on the microplot on timberland at time 1 then grew over the 5.0-inch threshold at time 2 (at threshold size the tree is tallied with the subplot) and the condition no longer qualifies as timberland but is still forestland. This can occur when the COND.RESERVCD changes from 0 to 1. For the timberland land basis, the tree is a diversion at the midpoint between time 1 and 2 with a TPAGROW_UNADJ value based on the microplot (74.965282 trees per acre), but the same tree is ingrowth on forestland and is assigned the subplot TPAGROW_UNADJ value (6.018046 trees per acre). Because the TREE table only stores one value for TPAGROW_UNADJ the traditional script does not employ the appropriate TPAGROW_UNADJ value in these rare cases.

Note that this same issue applies to estimates of removals and mortality. The TREE table stores one value each for TPAREMV_UNADJ and TPAMORT_UNADJ, but there could be two different values for any of these attributes in rare cases

7.3 Improved net growth estimation

The following example indicates how the traditional net growth script is modified to use the appropriate TPAGROW_UNADJ values and adjustment factors for nonsampled area. To store these values for remeasurement trees properly, a new data table, TREE_GRM_ESTN, was added to FIADB version 5.1.04. This table may have up to six records per tree depending on applicable land bases (timberland or forestland) and estimation types (all live, growing stock, or sawlog). See the full table description of TREE_GRM_ESTN in chapter 3 for descriptions of each attribute.

The modified script has some important improvements over the traditional script. The remeasurement adjustment factor is determined from TREE_GRM_ESTN.SUBPTYP_GRM. Also, given that the new table has separate records for timberland and forestland estimates, the varying TPAGROW_UNADJ values for the same tree can be stored without conflict.

Finally, the table stores the annual net growth, removal, and mortality volume of each tree. The combined values of ESTIMATE, ESTN_TYPE, ESTN_UNITS, and LAND_BASIS on each record identify the estimate (e.g., volume of all live in cubic feet on timberland) that the ANN_NET_GROWTH, REMOVALS, or MORTALITY attributes represent. The multiple records per tree and the combination of values available in the estimate descriptor, land basis,

and GRM columns can be used in place of the GRM columns in the TREE table (e.g., FGROWCFAL, FREMVBFGS, and FMORTCFSL).

Example 4.13 Estimate net growth of live trees on forest land using improved script (cubic feet per year)

```
SELECT ROUND(SUM(psm.expns * grm.tpagrow_unadj * -- use tpagrow_unadj for trees per acre
        DECODE(grm.subptyp_grm, -- use subptyp_grm for adjustment factor
              1,
              psm.adj_factor_subp,
              2,
              psm.adj_factor_micr,
              3,
              psm.adj_factor_macr) *
          NVL(grm.ann_net_growth, -- analogous to tree.fgrowcfal
            0))) AS estimate_improved
  FROM tree_grm_estn          grm, -- added to obtain SUBPTYP_GRM, TPAGROW_UNADJ, etc.
     tree                      t,
     cond                      c,
     plot                      p,
     pop_plot_stratum_assgn    ppsa,
     pop_stratum               psm,
     pop_estn_unit             peu,
     pop_eval                  pev,
     pop_eval_typ              pet,
     pop_eval_grp              peg
 WHERE grm.estn_units = 'CF' -- cubic feet, added to filter tree_grm_estn to single record
   AND grm.estn_type = 'AL' -- all live trees, added to filter tree_grm_estn to single record
   AND grm.estimate = 'VOLUME' -- added to filter tree_grm_estn to single record
   AND grm.land_basis = 'FORESTLAND' -- added to filter tree_grm_estn to single record
   AND t.cn = grm.tre_cn
   AND t.condid = c.condid
   AND t.plt_cn = c.plt_cn
   AND c.plt_cn = p.cn
   AND p.cn = ppsa.plt_cn
   AND ppsa.stratum_cn = psm.cn
   AND psm.estn_unit_cn = peu.cn
   AND peu.eval_cn = pev.cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_typ = 'EXPGROW'
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272012-- the desired evaluation group must be specified
```

The example above produces the following estimate of total net growth of live trees on forest land (cubic feet per year):

ESTIMATE_IMPROVED
391,577,176

Note that the difference between the traditional and improved estimate in this example is less than 0.05 percent. This small difference is due to the rare number of removal or mortality trees that need a different adjustment factor applied than is used in the traditional script, or due to a different TPAGROW_UNADJ value than is stored in the TREE table for the land basis (see section 7.2).

For this query, the values from the TREE_GRM_ESTN table are ‘AL’, ‘CF’, ‘VOLUME’, and ‘FORESTLAND’ for ESTN_TYPE, ESTN_UNITS, ESTIMATE, and LAND_BASIS, respectively. At present, volume is the only estimate available for net growth, removals and mortality. FIA may add tree level estimates for biomass and carbon in a future version of FIADB. See the TREE_GRM_ESTN table description in Chapter 3 for a complete list of valid values for ESTIMATE, LAND_BASIS, ESTN_TYPE, and ESTN_UNITS.

7.4 Net growth estimation summarized by current or previous attributes

The script can be further modified to summarize the total net growth estimate by any time 2 plot, condition, or tree attribute. For example, users may be interested in summarizing the net growth by the current (time 2) stand-size class.

In this case, all of the growth on each tree in the condition is assigned to the current stand-size class of the associated condition. It does not account for any shifts in stand-size class that may have occurred between time 1 and time 2. To account for shifts in classified variables such as stand-size class, see the examples related to net growth accounting in section 7.5.

Example 4.14 Estimate net growth of live trees on forest land (cubic feet per year) by current stand-size class

```
SELECT c.stdszcd, -- added to summarize estimate by current stdszcd
     ROUND(SUM(psm.expns * grm.tpagrow_unadj *
          DECODE(grm.subptyp_grm,
               1,
               psm.adj_factor_subp,
               2,
               psm.adj_factor_micr,
               3,
               psm.adj_factor_macr) *
          NVL(grm.ann_net_growth,
            0))) AS estimate_improved
  FROM tree_grm_estn          grm,
     tree                     t,
     cond                     c,
     plot                     p,
     pop_plot_stratum_assgn   ppsa,
     pop_stratum              psm,
     pop_estn_unit            peu,
     pop_eval                 pev,
     pop_eval_grp             peg,
     pop_eval_typ             pet
 WHERE grm.estn_units = 'CF' -- cubic feet, change to 'BF' when ESTN_TYPE = 'SL'
   AND grm.estn_type = 'AL' -- all live, change to 'GS' or 'SL' for growing-stock or sawlog estimates
   AND grm.estimate = 'VOLUME' -- volume is only valid value, biomass coming in future
   AND grm.land_basis = 'FORESTLAND' -- forestland, change to 'TIMBMERLAND' if desired
   AND t.cn = grm.tre_cn
   AND p.cn = c.plt_cn
   AND t.plt_cn = c.plt_cn
   AND t.condid = c.condid
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
```

```
  AND peu.cn = psm.estn_unit_cn
  AND pev.cn = peu.eval_cn
  AND pev.cn = pet.eval_cn
  AND pet.eval_typ = 'EXPGROW'
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272012
GROUP BY c.stdszcd -- added to summarize estimate by current stdszcd
```

Example 4.14 produces the following estimates of total net growth of all live trees on forest land by current stand-size class (cubic feet per year, description of code added for clarity):

STDSZCD	DESCRIPTION	ESTIMATE_IMPROVED
NULL	Nonforest	-1,307,392
1	Large diameter stands	147,444,679
2	Medium diameter stands	208,622,122
3	Small diameter stands	42,857,128
5	Nonstocked stands	-6,039,360
	SUM	**391,577,177**

There may be minor rounding differences between the sum of the subtotals from this script and the sum of total net growth in example 4.13.

Also, there is an estimate for STDSZCD = NULL (-1,307,392 cubic feet per year). This is the amount of net growth that occurred on conditions where STDSZCD was not computed at time 2. This is the case on land that was forestland at time 1 but diverted to nonforest by time 2. The amount of net growth that occurred on these conditions is summarized without a designated stand size class in this script.

The script can be further modified to link not only to the condition record at time 2, but also to the condition record at time 1 by using TREE.PREVCOND to link each tree record to its previous condition. We also added a group by clause to produce estimates by condition level attributes COND_STATUS_CD (condition status code) and STDSZCD (stand-size class code) at both points in time. This procedure is shown in example 4.15, which was created by adding the bold sections to example 4.14.

Example 4.15 Estimate net growth of live trees on forest land (cubic feet per year) by condition status and stand-size class at two points in time

```
SELECT c_past.cond_status_cd past_cond_status_cd,
    c_past.stdszcd past_stdszcd,
    c.cond_status_cd current_cond_status_cd,
    c.stdszcd current_stdszcd,
    ROUND(SUM(psm.expns * grm.tpagrow_unadj *
        DECODE(grm.subptyp_grm,
            1,
            psm.adj_factor_subp,
            2,
            psm.adj_factor_micr,
            3,
            psm.adj_factor_macr) * NVL(grm.ann_net_growth, 0))) AS estimate_improved
```

```
 FROM tree_grm_estn          grm,
    cond                     c_past, --past condition is added
    tree                     t,
    cond                     c,
    plot                     p,
    pop_plot_stratum_assgn   ppsa,
    pop_stratum              psm,
    pop_estn_unit            peu,
    pop_eval                 pev,
    pop_eval_grp             peg,
    pop_eval_typ             pet
WHERE grm.estn_units = 'CF' -- cubic feet, change to 'BF' when ESTN_TYPE = 'SL'
  AND grm.estn_type = 'AL' -- all live, change to 'GS' or 'SL' for growing-stock or sawlog estimates
  AND grm.estimate = 'VOLUME' -- volume is only valid value
  AND grm.land_basis = 'FORESTLAND' -- forestland, change to 'TIMBERLAND' if desired
  AND t.cn = grm.tre_cn
  AND c_past.plt_cn = p.prev_plt_cn
                    -- links to only those conditions at previous measurement of plot
  AND c_past.condid = t.prevcond -- links trees to their past condition
  AND c.plt_cn = t.plt_cn
  AND c.condid = t.condid
  AND p.cn = c.plt_cn
  AND ppsa.plt_cn = p.cn
  AND ppsa.stratum_cn = psm.cn
  AND peu.cn = psm.estn_unit_cn
  AND pev.cn = peu.eval_cn
  AND pev.cn = pet.eval_cn
  AND pet.eval_typ = 'EXPGROW'
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272012
GROUP BY c_past.cond_status_cd,
      c_past.stdszcd,
      c.cond_status_cd,
      c.stdszcd
```

Example 4.15 produces the following estimates of net growth of live trees on forest land by past and current COND_STATUS_CD and STDSZCD (cubic feet per year).

PAST_COND_STATUS_CD	PAST_STDSZCD	CURRENT_COND_STATUS_CD	CURRENT_STDSZCD	ESTIMATE_IMPROVED
1	1	1	1	69,385,227
1	1	1	2	-4,349,388
1	1	1	3	-10,120,849
1	1	1	5	-1,163,256
1	1	2		505,176
1	1	3		-737,273
1	1	4		-382,522
1	2	1	1	17,894,694
1	2	1	2	132,763,068
1	2	1	3	-2,660,142
1	2	1	5	-5,235,237
1	2	2		-493,065

PAST_COND_STATUS_CD	PAST_STDSZCD	CURRENT_COND_STATUS_CD	CURRENT_STDSZCD	ESTIMATE_IMPROVED
1	3	1	1	4,216,164
1	3	1	2	43,400,480
1	3	1	3	46,272,446
1	3	1	5	-140,869
1	3	2		54,522
1	3	3		-31,583
1	5	1	1	999,684
1	5	1	2	82,267
1	5	1	3	781,273
1	5	1	5	-33,518
1	5	2		-222,648
2		1	1	51,077,105
2		1	2	33,808,231
2		1	3	8,017,154
2		1	5	533,520
3		1	1	1,061,926
3		1	2	1,200,634
3		1	3	180,090
4		1	1	2,809,879
4		1	2	1,716,831
4		1	3	387,155
			SUM	**391,577,176**

There may be minor rounding differences between the sum of the subtotals from this script and the total net growth script in example 4.13.

The following tabulation of estimated net growth on forest land by condition status code and stand-size class at the two points in time can be made from the example 4.15 results. We have added the code labels to the row and column headings, and each cell in table 21 is the appropriate value from example 4.15.

Table 21 Estimated total net growth of live trees on forest land by past and current condition status code and stand-size class, Minnesota, 2012 (cubic feet per year)

		CURRENT_COND_STATUS_CD								Total
		1 Forest land CURRENT_STDSZCD				Total on forestland	2 Nonforest land	3 Noncensus water	4 Census water	
PAST_COND_STATUS_CD	PAST_STDSZCD	1 Large diameter	2 Medium diameter	3 Small diameter	5 Non-stocked					
1 Forest land	1 Large diameter	69,385,227	-4,349,388	-10,120,849	-1,163,256	53,751,734	505,176	-737,273	-382,522	53,137,115
	2 Medium diameter	17,894,694	132,763,068	-2,660,142	-5,235,237	142,762,383	-493,065	0	0	142,269,318
	3 Small diameter	4,216,164	43,400,480	46,272,446	-140,869	93,748,221	54,522	-31,583	0	93,771,160
	5 Nonstocked	999,684	82,267	781,273	-33,518	1,829,706	-222,648	0	0	1,829,706
Total on forest land		92,495,769	171,896,427	34,272,728	-6,572,880	292,092,044	-156,015	-768,856	-382,522	291,007,299
2 Nonforest land		51,077,105	33,808,231	8,017,154	533,520	93,436,010				93,436,010
3 Noncensus water		1,061,926	1,200,634	180,090	0	2,442,650				2,442,650
4 Census water		2,809,879	1,716,831	387,155	0	4,913,865				4,913,865
Total net growth		147,444,679	208,622,123	42,857,127	-6,039,360	392,884,569	-156,015	-768,856	-382,522	391,577,176

7.5 Net growth estimation using the accounting method

The net growth estimates in the previous examples are summaries of the biological net growth on each tree by either a current or past attribute, or a matrix consisting of both classifications. However, these scripts still do not take into account volume shifts across classified attributes that can change value between time 1 and time 2. Instead they only summarize the difference in volume on individual trees between time 1 and time 2 based on the attributes of interest. In order to account for volume that moves into and out of a single class between time 1 and time 2, some users may find it more appropriate to use a script that assigns the beginning and end volume to the initial and final class for the attribute of interest. This is referred to as the accounting method.

FIA uses the annual net growth equation defined by Bechtold and Patterson (2005):

(Volume t2 – Volume t1)/ REMPER

where REMPER is the remeasurement period in years.

To compute the net growth on a tree that had a volume of 1.705 cubic feet at time 1 and a volume of 3.835 cubic feet at time 2 and remeasurement period of 5.5 years, the equation solves as follows:

(3.835 cubic feet – 1.705 cubic feet)/ 5.5 years = 0.387 cubic feet per year

All of the previous net growth examples summarized this end result (0.387 cubic feet per year), which is the biological net growth of the tree. They assigned the resulting value for each tree (expanded to the population level) to either a previous or current classification, or a matrix consisting of both classifications. While those are valid analyses, the results may not match actual shifts in volume across classified attributes that change between time 1 and time 2 (as e.g., stand-size class). To match shifts in volume across a classified variable such as stand-size class, users can employ the accounting method which uses an algebraically equivalent form of the standard equation.

(Volume t2 – Volume t1)/ REMPER

can also be expressed as:

(Volume t2/ REMPER) - (Volume t1/ REMPER)

So the same tree can be represented as:

(3.835 cubic feet /5.5 years) - (1.705 cubic feet /5.5 years)

0.697 cubic feet per year – 0.310 cubic feet per year = 0.387 cubic feet per year

Instead of summarizing the end result of the equation, the accounting method assigns the time 1 annualized volume (-0.310 cubic feet per year) to the time 1 attribute value and the time 2 annualized volume (0.697 cubic feet per year) to the time 2 attribute value. This effectively accounts for outgrowth from the time 1 class and ingrowth into the time 2 class. In the case where

the time 1 class and the time 2 class have the same value, the net result is that the biological net growth of the tree is assigned to that class (0.387 cubic feet per year). If the attribute changes value over the remeasurement period, then the beginning annualized volume is deducted from the initial class and the ending annualized volume is added to the time 2 class.

In the current FIADB version only certain remeasurement evaluations have the necessary data to employ the accounting method. The evaluations that can use the accounting method are identified by POP_EVAL.GROWTH_ACCT = 'Y'. It is currently not available on periodic-to-periodic or periodic-to-annual remeasurement plots.

The TREE table must be joined to the COND table twice for current and past condition attributes as well as the TREE_GRM_ESTN table as shown in example 4.15. As described previously, the TREE_GRM_ESTN table contains multiple records per tree and must be filtered properly to obtain the appropriate estimate. In addition to the previously discussed attributes, the table stores the remeasurement period, the beginning and end volume estimates, beginning and end diameters, and component values (e.g., survivor, ingrowth, mortality, cut, diversion, and reversion). In cases with mortality and removal trees, midpoint diameter and volume estimates are supplied in lieu of the ending estimates.

Furthermore, the BEGINEND table is added (without a join) to split the record into two time periods (time 1 and time 2). This allows the beginning estimate to be summarized by the time 1 attribute and the end (or midpoint) estimate to be summarized by the time 2 attribute.

Finally, depending on the summary attribute, removal and mortality trees may use either the previous value or a midpoint value. At this time, only two attributes (diameter and stand age) have been identified as attributes that can be defined at the midpoint on removal and mortality trees. In all other cases, the previous attribute value is assigned to removal and mortality trees.

Example 4.16 Estimate net growth of live trees on forest land (cubic feet per year) by condition status and stand-size class using the accounting method

```
SELECT DECODE(be.oneortwo,
          1, c_past.stdszcd, -- if time 1 then use past stand-size code
          2, DECODE(grm.component,
         -- for survivor, ingrowth and reversion trees, use the time 2 stand-size code
               'SURVIVOR', c.stdszcd,
               'INGROWTH', c.stdszcd,
               'REVERSION1',c.stdszcd,
               'REVERSION2',c.stdszcd,
         -- use the past stand-size code on all other component values (removal and mortality) at time 2
               c_past.stdszcd)
               ) AS stdszcd,
     ROUND(SUM(psm.expns * grm.tpagrow_unadj *
           DECODE(grm.subptyp_grm,
                1, psm.adj_factor_subp,
                2, psm.adj_factor_micr,
                3, psm.adj_factor_macr) *
           NVL(DECODE(BE.oneortwo,
                    1,
         -- for time 1, set the beginning estimate negative and divide by remper to annualize
                    (-grm.est_begin / grm.remper),
```

```
                2,
        -- for time 2, use the end estimate if populated, otherwise use midpoint estimate
                ((NVL(grm.est_end, grm.est_midpt)
        -- for time 2, must subtract mortality to obtain net growth and divide by remper to annualize
                - NVL(grm.mortality, 0)) / grm.remper)),
            0))) AS estimate_accounting
 FROM beginend                  be, -- added to split tree_grm_estn record into time 1 and 2
    cond                         c_past,
    tree_grm_estn               grm,
    tree                         t,
    cond                        c,
    plot                        p,
    pop_plot_stratum_assgn      ppsa,
    pop_stratum                 psm,
    pop_estn_unit               peu,
    pop_eval                    pev,
    pop_eval_typ                pet,
    pop_eval_grp                peg
WHERE grm.estn_units = 'CF' -- cubic feet, added to filter tree_grm_estn table to single record
  AND grm.estn_type = 'AL' -- all live, added to filter tree_grm_estn table to single record
  AND grm.estimate = 'VOLUME' -- volume, added to filter tree_grm_estn table to single record
  AND grm.land_basis = 'FORESTLAND'  -- forestland, added to filter tree_grm_estn table to single record
  AND t.cn = grm.tre_cn
  AND t.prevcond = c_past.condid
  AND p.prev_plt_cn = c_past.plt_cn
  AND t.condid = c.condid
  AND t.plt_cn = c.plt_cn
  AND c.plt_cn = p.cn
  AND p.cn = ppsa.plt_cn
  AND ppsa.stratum_cn = psm.cn
  AND psm.estn_unit_cn = peu.cn
  AND peu.eval_cn = pev.cn
  AND pev.growth_acct = 'Y'-- added to ensure evaluation is suitable for using the accounting method
  AND pev.cn = pet.eval_cn
  AND pet.eval_typ = 'EXPGROW'
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272012
GROUP BY DECODE(be.oneortwo,
          1,
          c_past.stdszcd,
          2,
          DECODE(grm.component,
               'SURVIVOR',
               c.stdszcd,
               'INGROWTH',
               c.stdszcd,
               'REVERSION1',
               c.stdszcd,
               'REVERSION2',
               c.stdszcd,
               c_past.stdszcd))
```

Example 4.16 produces the following estimates of net growth of live trees on forestland by stand-size class using the accounting method (cubic feet per year, description of code added for clarity):

STDSZCD	DESCRIPTION	ESTIMATE_ACCOUNTING
NULL	Nonforest land or water	0
1	Large diameter stands	255,647,327
2	Medium diameter stands	122,604,649
3	Small diameter stands	18,103,383
5	Nonstocked stands	-4,778,189
	SUM	**391,577,170**

This results in an estimated stand-size class distribution that is quite different from the distribution in any of the previous estimates. Note there is also a slight difference in the total estimate of growth due to rounding.

DESCRIPTION	Example 4.16 ESTIMATE_ACCOUNTING	Example 4.14 ESTIMATE_CURRENT	Example 4.15 ESTIMATE_PAST
Nonforest land or water	0	-1,307,392	100,792,524
Large diameter stands	255,647,327	147,444,679	53,137,114
Medium diameter stands	122,604,649	208,622,122	142,269,318
Small diameter stands	18,103,383	42,857,128	93,771,161
Nonstocked stands	-4,778,189	-6,039,360	1,607,059
SUM	**391,577,170**	**391,577,177**	**391,577,176**

The accounting script assigns the net growth on reverted and diverted conditions to the current and previous stand-size classes, respectively. As a result, there is not an estimate of net growth on nonforest conditions using the accounting script.

Comparison of net change in inventory to net growth accounting

The results from the net growth accounting script are more in line with the shifts in inventory volume within each class than with summaries by the current or past stand-size class alone (or even in combination as shown in example 4.15). Because not all inventory plots are remeasured, it is not possible to match the exact change in inventory volume estimates (which includes plots that are not remeasured) by summing net growth and removals from just those plots that are remeasured, but the trends should be similar, especially as the proportion of remeasured plots increases.

For comparison, we use this formula for net change:

Annual Net Growth – Annual Removals = Annual Net Change
which can be expressed as:

Annual Net Growth = Annual Net Change + Removals

The tabulation below shows inventory estimates for live trees on forestland in MN 2007 and 2012 from the EXPVOL evaluation (EVALID = 270701 and 271201). Given that Minnesota is on a five year remeasurement period, an approximate net annual change is derived by taking the difference in volume in each class and dividing by an average five year remeasurement period. By adding in the average annual removal rate (using the past stand-size class distribution), a net annual growth rate for each stand-size class can be approximated from the difference in the inventory volume estimates. Given the stated limitations of comparing estimates from inventory and remeasurement plots, the accounting method is the best overall match of the various net growth estimates on the

remeasurement plots in examples 4.14, 4.15, and 4.16 to the approximate net growth from the inventory plots within each stand-size class.

Stand-size Class	MN 2007 INVENTORY	MN 2012 INVENTORY	Approx. Annual Net Change	Annual Removals (Past Stand-size class)	Approx. Annual Net Growth
Large diameter	9,251,542,235	9,832,976,829	116,286,919	117,920,443	234,207,362
Medium diameter	7,398,748,707	7,600,320,439	40,314,346	98,051,054	138,365,400
Small diameter	1,284,388,610	1,358,551,560	14,832,590	4,873,375	19,705,965
Nonstocked	14,781,817	11,068,118	-742,740	54,769	-687,971
SUM	**17,949,461,374**	**18,802,916,946**	**170,691,114**	**220,899,643**	**391,590,757**

The estimates of inventory volume on forestland in MN 2007 and MN 2012 could be derived from only the remeasurement plots in the MN 2012 EXPGROW evaluation and the beginning and ending volume estimates from the TREE_GRM_ESTN table. Also, the actual remeasurement period for each plot can be applied to each tree record instead of using an average five year remeasurement period. Doing so results in a much better match with the net growth estimate, as it should because this is how the net growth estimates are derived. The only differences in net growth using this method are due to rounding error. The user should be aware that the inventory estimates from the remeasured plots will not match the EXPVOL evaluation estimates.

Stand-size Class	MN 2007 INVENTORY ON REMEASURED PLOTS ONLY	MN 2012 INVENTORY ON REMEASURED PLOTS ONLY	Annual Net Change	Annual Removals (Past Stand-size Class)	Annual Net Growth Calculated
Large diameter	9,680,288,608	10,391,533,019	137,726,900	117,920,443	255,647,334
Medium diameter	7,899,134,711	8,026,733,506	24,553,560	98,051,054	122,604,652
Small diameter	1,362,321,142	1,426,728,252	13,230,008	4,873,375	18,103,384
Nonstocked	36,526,698	12,211,955	-4,832,958	54,769	-4,778,189
SUM	**18,978,271,159**	**19,857,206,732**	**170,677,510**	**220,899,643**	**391,577,181**

Which net growth script is "right"?

Because all of the estimates above are valid, which option should be used: accounting, current, or previous? It really depends on the question at hand, but FIA recommends using accounting for most attributes that can change class between two points in time because it accounts for volume shifts into and out of each class. But there could be situations where users may not want to use the accounting method for such attributes.

For example, to identify net growth that occurred on stands that were medium diameter (poletimber size) at time 2, regardless of the stand-size class at time 1, then choose the script in example 4.14.

To identify net growth that occurred on stands that were formerly nonstocked at time 1, regardless of the stand-size class at time 2, then use the table joins from example 4.14 because it has the join to the past condition. Modify the script slightly by removing c.stdszcd, c.cond_status_cd, and

c_past.cond_status_cd from the select and group by statements so that c_past.stdzscd remains the only attribute of interest.

To determine the net growth that occurred on stands that were sawlog size at time 2 and distinguish stand-size class at time 1, then use example 4.15 as it is.

To know how much net growth occurred within a certain stand-size class between time 1 and time 2, accounting for volume movement both into and out of that stand-size class, then employ the accounting method script (example 4.16).

If the value of the attribute of interest should not change over time (e.g., state, county, species) then it is not necessary to use the accounting method.

Accounting method for removal or mortality trees

On mortality and removal trees, the accounting script in example 4.16 uses the previous attribute value in lieu of the time 2 value. According to Bechtold and Patterson (2005), the event that caused the removal or mortality is deemed to occur at the midpoint of the remeasurement period. Currently, FIA does not compute and store values for most attributes at the midpoint of the remeasurement period. In most cases, only the time 1 and time 2 values are available. Because the event that results in a removal or mortality tree can also significantly change the condition, it is generally acceptable to consider that the removal or mortality occurred while that attribute held its time 1 value.

For example, consider a forest condition that was a large stand-size class (sawlog size, STDSZCD = 1) at time 1, then was harvested prior to time 2, where it was recorded as a small stand-size class (seedling/sapling, STDSZCD = 3) after the harvest. In such a scenario it is logical that the removals were from the large class recorded at time 1, and not from the small class as recorded at time 2.

Special cases for removal and mortality trees (midpoint attribute is available)

At this point, we have only identified two exceptions when the midpoint attribute value is used in the accounting script. First, when a midpoint value has been determined and is stored in the database (estimated midpoint tree diameter on removal and mortality trees stored in TREE_GRM_ESTN.DIA_MIDPT) and when it is relatively easy and acceptable to calculate the midpoint value “on-the-fly” (e.g., stand age). The midpoint stand age is derived by starting with the previous stand age and adding one-half of the remeasurement period between time 1 and time 2. Both of these attributes are usually assigned to broader classes such as a 2-inch diameter class and 5-, 10-, or 20-year age classes.

Example 4.17 Estimate net growth of live trees on forest land by diameter class using the accounting method

```
SELECT DECODE(be.oneortwo,
        1,
        ((TRUNC(grm.dia_begin / 2 + .5)) * 2),
        2,
        DECODE(grm.component,
            'SURVIVOR',
            ((TRUNC(grm.dia_end / 2 + .5)) * 2),
            'INGROWTH',
            ((TRUNC(grm.dia_end / 2 + .5)) * 2),
```

```
                'REVERSION1',
                ((TRUNC(grm.dia_end / 2 + .5)) * 2),
                'REVERSION2',
                ((TRUNC(grm.dia_end / 2 + .5)) * 2),
                ((TRUNC(grm.dia_midpt / 2 + .5)) * 2))) AS diaclass,
      ROUND(SUM(psm.expns * grm.tpagrow_unadj *
            DECODE(grm.subptyp_grm,
                  1,
                  psm.adj_factor_subp,
                  2,
                  psm.adj_factor_micr,
                  3,
                  psm.adj_factor_macr) *
            NVL(DECODE(BE.oneortwo,
                     1,
                     (-grm.est_begin / grm.remper),
                     2,
                     ((NVL(grm.est_end, grm.est_midpt) -
                     NVL(grm.mortality, 0)) / grm.remper)),
                0))) AS estimate_accounting
  FROM beginend                 be,
      tree                      prev_tre,
      cond                      prev_cnd,
      plot                      prev_plt,
      tree_grm_estn             grm,
      tree                      t,
      cond                      c,
      plot                      p,
      pop_plot_stratum_assgn    ppsa,
      pop_stratum               psm,
      pop_estn_unit             peu,
      pop_eval                  pev,
      pop_eval_typ              pet,
      pop_eval_grp              peg
 WHERE grm.estn_units = 'CF'
   AND grm.estn_type = 'AL'
   AND grm.estimate = 'VOLUME'
   AND grm.land_basis = 'FORESTLAND'
   AND t.cn = grm.tre_cn
   AND t.prev_tre_cn = prev_tre.cn(+)
   AND t.prevcond = prev_cnd.condid
   AND prev_plt.cn = prev_cnd.plt_cn
   AND p.prev_plt_cn = prev_plt.cn
   AND t.condid = c.condid
   AND t.plt_cn = c.plt_cn
   AND c.plt_cn = p.cn
   AND p.cn = ppsa.plt_cn
   AND ppsa.stratum_cn = psm.cn
   AND psm.estn_unit_cn = peu.cn
   AND peu.eval_cn = pev.cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_typ = 'EXPGROW'
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272012
 GROUP BY DECODE(be.oneortwo,
             1,
             ((TRUNC(grm.dia_begin / 2 + .5)) * 2),
```

```
2,
DECODE(grm.component,
      'SURVIVOR',
      ((TRUNC(grm.dia_end / 2 + .5)) * 2),
      'INGROWTH',
      ((TRUNC(grm.dia_end / 2 + .5)) * 2),
      'REVERSION1',
      ((TRUNC(grm.dia_end / 2 + .5)) * 2),
      'REVERSION2',
      ((TRUNC(grm.dia_end / 2 + .5)) * 2),
      ((TRUNC(grm.dia_midpt / 2 + .5)) * 2)))
```

The above example produces the following estimates of net growth of live trees on forest land by diameter class using the accounting method.

DIACLASS	ESTIMATE_ACCOUNTING
NULL	0
6	60,392,809
8	52,107,006
10	51,645,734
12	49,336,979
14	41,169,091
16	35,775,248
18	26,269,684
20	13,636,472
22	23,230,879
24	9,899,035
26	7,412,552
28	3,124,833
30	1,477,268
32	5,397,687
34	7,463,422
36	-2,312,818
38	1,373,552
40	538,072
42	2,683,306
46	549,730
50	-3,409,450
52	3,816,079
SUM	**391,577,170**

Example 4.18 Estimate net growth of live trees on forest land by stand-age class using the accounting method

```
SELECT CASE
      WHEN stand_age IS NULL THEN
       'Unknown'
      WHEN stand_age <= 20 THEN
       '000-020 years'
      WHEN stand_age > 20 and stand_age <= 40 THEN
       '021-040 years'
```

```
      WHEN stand_age > 40 and stand_age <= 60 THEN
       '041-060 years'
      WHEN stand_age > 60 and stand_age <= 80 THEN
       '061-080 years'
      WHEN stand_age > 80 and stand_age <= 100 THEN
       '081-100 years'
      WHEN stand_age > 100 THEN
       '100+ years'
      ELSE
       'Unknown'
    END stand_age_class,
    ROUND(SUM(ESTIMATE)) AS ESTIMATE
FROM (SELECT DECODE(be.oneortwo,
                1,
                prev_cnd.stdage,
                2,
                DECODE(grm.component,
                     'SURVIVOR',
                     c.stdage,
                     'INGROWTH',
                     c.stdage,
                     'REVERSION1',
                     c.stdage,
                     'REVERSION2',
                     c.stdage,
                     (prev_cnd.stdage + ROUND(NVL(p.remper, 0) / 2)))) AS stand_age,
          SUM(psm.expns * grm.tpagrow_unadj *
             DECODE(grm.subptyp_grm,
                  1,
                  psm.adj_factor_subp,
                  2,
                  psm.adj_factor_micr,
                  3,
                  psm.adj_factor_macr) *
             NVL(DECODE(BE.oneortwo,
                    1,
                    (-grm.est_begin / grm.remper),
                    2,
                    ((NVL(grm.est_end, grm.est_midpt) -
                    NVL(grm.mortality, 0)) / grm.remper)),
              0)) AS estimate
       FROM beginend                 be,
          tree                       prev_tre,
          cond                       prev_cnd,
          plot                       prev_plt,
          tree_grm_estn              grm,
          tree                       t,
          cond                       c,
          plot                       p,
          pop_plot_stratum_assgn     ppsa,
          pop_stratum                psm,
          pop_estn_unit              peu,
          pop_eval                   pev,
          pop_eval_typ               pet,
          pop_eval_grp               peg
      WHERE grm.estn_units = 'CF'
        AND grm.estn_type = 'AL'
```

```
       AND grm.estimate = 'VOLUME'
       AND grm.land_basis = 'FORESTLAND'
       AND t.cn = grm.tre_cn
       AND t.prev_tre_cn = prev_tre.cn(+)
       AND t.prevcond = prev_cnd.condid
       AND prev_plt.cn = prev_cnd.plt_cn
       AND p.prev_plt_cn = prev_plt.cn
       AND t.condid = c.condid
       AND t.plt_cn = c.plt_cn
       AND c.plt_cn = p.cn
       AND p.cn = ppsa.plt_cn
       AND ppsa.stratum_cn = psm.cn
       AND psm.estn_unit_cn = peu.cn
       AND peu.eval_cn = pev.cn
       AND pev.cn = pet.eval_cn
       AND pet.eval_typ = 'EXPGROW'
       AND pet.eval_grp_cn = peg.cn
       AND peg.eval_grp = 272012
     GROUP BY DECODE(be.oneortwo,
                1,
                prev_cnd.stdage,
                2,
                DECODE(grm.component,
                     'SURVIVOR',
                     c.stdage,
                     'INGROWTH',
                     c.stdage,
                     'REVERSION1',
                     c.stdage,
                     'REVERSION2',
                     c.stdage,
                     (prev_cnd.stdage +
                     ROUND(NVL(p.remper, 0) / 2)))))
GROUP BY CASE
       WHEN stand_age IS NULL THEN
        'Unknown'
       WHEN stand_age <= 20 THEN
        '000-020 years'
       WHEN stand_age > 20 and stand_age <= 40 THEN
        '021-040 years'
       WHEN stand_age > 40 and stand_age <= 60 THEN
        '041-060 years'
       WHEN stand_age > 60 and stand_age <= 80 THEN
        '061-080 years'
       WHEN stand_age > 80 and stand_age <= 100 THEN
        '081-100 years'
       WHEN stand_age > 100 THEN
        '100+ years'
       ELSE
        'Unknown'
     END
```

The above example produces the following estimates of net growth of live trees on forest land by stand-age class using the accounting method.

STAND_AGE_CLASS	ESTIMATE_ACCOUNTING
000-020 years	5,744,309
021-040 years	41,254,878
041-060 years	-54,780,365
061-080 years	124,418,003
081-100 years	176,489,457
100+ years	98,450,887
SUM	**391,577,169**

7.6 Net growth components

Net growth represents the change in volume of trees between two points in time (e.g., previous 2006 inventory and current 2011 inventory) accounting for gains in growth and losses from mortality but not for removal of volume due to cutting or land-use change. To help understand these changes in volume, net growth is broken down into a number of components.

FIA identifies the following components of net growth associated with forest land:

- Survivor growth — change in volume of live trees between inventories on land identified as forest in both inventories. Identified as SURVIVOR in table of Example 4.19 below.
- Mortality — volume (negative) of live trees from the previous inventory that died before the current inventory. The land was forest in the previous inventory. Identified as MORTALITY1 and MORTALITY2 in table of Example 4.19 below.
- Ingrowth — volume of trees that grew into a merchantable size (e.g., 5-inch diameter) since the previous inventory. The volume is not counted until the current inventory and the land is identified as forest in both inventories. Identified as INGROWTH in table of Example 4.19 below.
- Reversion — volume of live trees on land that is now forest but was previously nonforest. Identified as REVERSION1 and REVERSION2 in table of Example 4.19 below.
- Diversion growth — change in volume of live trees between inventories on land that changed from forest to nonforest. Diversion only counts trees that remained present and living. Identified as DIVERSION1 and DIVERSION2 in table of Example 4.19 below.
- Cut growth — increase in volume of live trees from the previous inventory that were cut before the current inventory. The land was forest in the previous inventory. Identified as CUT1 and CUT2 in table of Example 4.19 below.

In example 4.19, we estimate net growth of growing- and nongrowing-stock trees on forest land by net growth component for Maine, 2011 and Maine, 2006. The total net growth estimate increased from 544.5 to 699.6 million cubic feet. Most of the increase is attributed to a decrease in mortality

and increases in reversions and ingrowth. The small increase in survivor growth had less of an effect.

Example 4.19 Estimate net growth of trees on forest land (cubic feet per year) by net growth component

```
SELECT peg.eval_grp,
   grm.component,
   SUM(psm.expns * grm.tpagrow_unadj * grm.ann_net_growth * -- in this case analogous to
tree.fgrowcfal
      decode(grm.subptyp_grm, 1, psm.adj_factor_subp,
         2, psm.adj_factor_micr,
         3, psm.adj_factor_macr, 0)) estimate -- "all live," growing and nongrowing stock on forest land
FROM plot                  p,
   cond                    c,
   pop_plot_stratum_assgn  ppsa,
   pop_stratum             psm,
   pop_estn_unit           peu,
   pop_eval                pev,
   pop_eval_grp            peg,
   pop_eval_typ            pet,
   tree                    t,
   tree_grm_estn           grm
WHERE p.cn = c.plt_cn
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp in (232006, 232011) -- the desired evaluation group(s) must be specified
   AND pet.eval_typ = 'EXPGROW'
   AND t.plt_cn = c.plt_cn
   AND t.condid = c.condid
   AND grm.tre_cn = t.cn
   AND grm.estn_type = 'AL' -- specify estimation type, AL for "all live," growing and nongrowing
stock
   AND grm.estn_units = 'CF' -- specify units, CF for cubic feet
   AND grm.estimate = 'VOLUME' -- specify estimate
   AND grm.land_basis = 'FORESTLAND' -- specify land basis
GROUP BY peg.eval_grp, grm.component
ORDER BY peg.eval_grp, grm.component
```

Produces the following:

EVAL_GRP	COMPONENT	ESTIMATE
232006	CUT1	33,912,555
232006	CUT2	1,643,007
232006	DIVERSION1	184,131
232006	INGROWTH	155,351,725
232006	MORTALITY1	-361,426,921
232006	MORTALITY2	0
232006	REVERSION1	7,798,281

EVAL_GRP	COMPONENT	ESTIMATE
232006	REVERSION2	36,662
232006	SURVIVOR	706,998,619
232011	CUT1	40,012,272
232011	CUT2	2,015,425
232011	DIVERSION1	326,866
232011	INGROWTH	194,629,689
232011	MORTALITY1	-304,764,329
232011	MORTALITY2	0
232011	REVERSION1	52,167,940
232011	REVERSION2	353,506
232011	SURVIVOR	714,829,723

Some of the component types are identified with a '1' or '2' (e.g., CUT1 and CUT2). The 1 denotes trees that met the minimum quality and/or size requirements in the previous inventory. The 2 denotes trees that did not meet minimum requirements in the previous inventory but meet the requirements in the current inventory. In the previous example using Maine, the current inventory is 2011 and the previous inventory is 2006 based on a five-year cycle of samples.

Diversion differs from the diversion component. When the land basis is forest land, as opposed to timberland, diversion is the volume of trees on land diverted from forest to nonforest between the previous and current inventory and is based on the midpoint in time between inventories. Tree size at the midpoint is modeled from the tree size at the previous inventory. When the land basis is timberland, diversions also include land diverted to reserved forest land (removed from timber production by statute or administrative designation) and less productive forest land (incapable of producing at least 20 cubic feet of growing stock per acre annually). The component is the change in volume of live trees between inventories on land that diverted and uses the modeled midpoint from the tree size at the previous inventory. This net growth component is equivalent to diversion growth in Bechtold and Patterson (2005).

When the land basis is forest land, reversion is the volume of trees on land that reverts from nonforest to forest between the previous and current inventory and is based on the modeled midpoint in time between inventories using the tree size in the current inventory. Unlike the diversion component of net growth, the reversion component, which is simply reversion, counts the total tree volume at the modeled midpoint between inventories. Thus, reversion can have substantially more impact on net growth estimates as compared to the impacts from diversion, given equal total tree volumes.

Cut or harvest removals differ from the cut component. Cut or harvest removals are the volume of trees cut or killed in conjunction with a harvest or silvicultural operation between the previous and current inventory and is based on the midpoint in time between inventories. Tree size at the midpoint is modeled from the tree size at the previous inventory. The cut component is only the increase in volume associated with these trees from the previous inventory to the modeled midpoint between inventories based on the tree size at the previous inventory. This net growth component is equivalent to cut growth in Bechtold and Patterson (2005).

Ingrowth differs from the ingrowth component. Ingrowth is the volume of trees at the time they grow across a minimum quality and/or size threshold between inventories. Minimum size thresholds vary by live, growing-stock, and sawtimber trees. Minimum quality thresholds apply to growing-stock and sawtimber trees. The growth on ingrowth is the volume the trees grew since crossing the minimum thresholds until the current inventory. The ingrowth component includes ingrowth plus growth on ingrowth.

Mortality is not equivalent to the mortality component (see Example 4.20). Mortality is the volume of trees that die from natural causes between the previous and current inventory and is based on the midpoint in time between inventories. Tree size at the midpoint is modeled from the tree size at the previous inventory. The mortality component equals the volume of the tree at the previous inventory. Thus, the mortality component of net growth is always smaller than mortality volume. Examples 4.19 and 4.20 focus on the same mortality component of net growth but example 4.19 represents the volume as negative.

Example 4.20.

M_{ng} = Mortality component of net growth
V_{mid} = Volume of tree at modeled midpoint between inventories or mortality volume
V_{t1} = Volume of tree at previous inventory
$M_{ng} = V_{mid} – (V_{mid} - V_{t1})$ or $M_{ng} = V_{t1}$

Bechtold and Patterson (2005) also cover the components presented here but present them in the context of net change. Presented in the context of net growth and as implemented in the FIA database, some component names differ in meaning as previously described.

7.7 Traditional removals estimation

In the following example, we demonstrate how FIA produced a tree-level removals estimate prior to FIADB 5.1.04.

The 2012 Minnesota evaluation used in this estimate (POP_EVAL.EVALID = 271203) consists of plots measured in 2003, 2004, 2005, 2006 and 2007 that were remeasured in 2008, 2009, 2010, 2011 and 2012, respectively.

Example 4.21. Estimate removals of live trees on forest land using traditional script (cubic feet per year)

```
SELECT ROUND(SUM(psm.expns * t.tparemv_unadj * t.fremvcfal *
        decode(t.dia,
             null,
             psm.adj_factor_subp,
             decode(least(t.dia, 5 - 0.001),
                  t.dia,
                  psm.adj_factor_micr,
                  decode(least(t.dia,
```

```
                    nvl(p.macro_breakpoint_dia, 9999) -
                    0.001),
                t.dia,
                psm.adj_factor_subp,
                psm.adj_factor_macr))))) estimate_traditional
 FROM cond                      c,
    plot                        p,
    tree                        t,
    pop_plot_stratum_assgn      ppsa,
    pop_stratum                 psm,
    pop_estn_unit               peu,
    pop_eval                    pev,
    pop_eval_grp                peg,
    pop_eval_typ                pet
WHERE p.cn = c.plt_cn
  AND pet.eval_typ = 'EXPREMV'
  AND t.plt_cn = c.plt_cn
  AND t.condid = c.condid
  AND ppsa.plt_cn = p.cn
  AND ppsa.stratum_cn = psm.cn
  AND peu.cn = psm.estn_unit_cn
  AND pev.cn = peu.eval_cn
  AND pev.cn = pet.eval_cn
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272012
```

The example above produces the following estimate of total removals of live trees on forest land (cubic feet per year):

ESTIMATE_TRADITIONAL
220,899,643

7.8 Improved removals estimation

The following example indicates how the traditional removals script is modified to use the appropriate TPAREMV_UNADJ values and adjustment factors for nonsampled area. See section 7.3 for a detailed explanation of the reasons for the modifications.

Example 4.22. Estimate removals of live trees on forest land using improved script (cubic feet per year)

```
SELECT ROUND(SUM(psm.expns * grm.tparemv_unadj * -- use tparemv_unadj for trees per acre per year
          DECODE(grm.subptyp_grm, -- use subptyp_grm for adjustment factor
              1,
              psm.adj_factor_subp,
              2,
              psm.adj_factor_micr,
              3,
```

```
            psm.adj_factor_macr) *
        NVL(grm.removals, -- analogous to tree.fremvcfal
          0))) AS estimate_improved
 FROM tree_grm_estn          grm, -- added to obtain SUBPTYP_GRM, TPAGROW_UNADJ et al.
    tree                      t,
    cond                      c,
    plot                      p,
    pop_plot_stratum_assgn    ppsa,
    pop_stratum               psm,
    pop_estn_unit             peu,
    pop_eval                  pev,
    pop_eval_typ              pet,
    pop_eval_grp              peg
WHERE grm.estn_units = 'CF' -- cubic feet, added to filter tree_grm_estn to single record
  AND grm.estn_type = 'AL' -- all live, added to filter tree_grm_estn to single record
  AND grm.estimate = 'VOLUME' -- added to filter tree_grm_estn to single record
  AND grm.land_basis = 'FORESTLAND' -- added to filter tree_grm_estn to single record
  AND t.cn = grm.tre_cn
  AND t.condid = c.condid
  AND t.plt_cn = c.plt_cn
  AND c.plt_cn = p.cn
  AND p.cn = ppsa.plt_cn
  AND ppsa.stratum_cn = psm.cn
  AND psm.estn_unit_cn = peu.cn
  AND peu.eval_cn = pev.cn
  AND pev.cn = pet.eval_cn
  AND pet.eval_typ = 'EXPREMV'
  AND pet.eval_grp_cn = peg.cn
  AND peg.eval_grp = 272012 -- the desired evaluation group must be specified
```

The example above produces the following estimate of total removals of live trees on forest land (cubic feet per year):

ESTIMATE_IMPROVED
220,899,670

In this example there is no difference between the traditional and improved estimates. Regardless, FIA recommends using the improved script because it will always use the appropriate TPAREMV_UNADJ and adjustment factors, whereas the traditional script, in rare cases, may not.

7.9 Removals estimation summarized by previous attributes

The script can be further modified to summarize the removals estimate by any previous plot, condition, or tree attribute. For example, users may be interested in summarizing the removals by the time 1 stand-size class.

According to Bechtold and Patterson (2005), the event that caused the removal is deemed to occur at the midpoint of the remeasurement period. Currently, FIA does not compute and store values for every attribute at the midpoint of the remeasurement period. In most cases, only the time 1 and time 2 values are available. Because the event that results in a removal or mortality tree can also significantly change the condition, it is generally acceptable to consider that the removal or mortality occurred while that attribute held its time 1 value.

For example, consider a forest condition that was a large stand-size class (sawlog size, STDSZCD = 1) at time 1, then was harvested prior to time 2, where it was recorded as a small stand-size class (seedling/sapling, STDSZCD = 3)) after the harvest. In such a scenario it is logical that the removals were from the large class recorded at time 1, and not from the small class as recorded at time 2.

Example 4.23. Estimate removals of live trees on forest land (cubic feet per year) by past stand-size class

```
SELECT c_past.stdszcd as past_stdszcd, -- added to summarize estimate by past stdszcd
     ROUND(SUM(psm.expns * grm.tparemv_unadj *
          DECODE(grm.subptyp_grm,
               1,
               psm.adj_factor_subp,
               2,
               psm.adj_factor_micr,
               3,
               psm.adj_factor_macr) * grm.removals)) AS estimate_improved
  FROM cond                      c_past, -- past condition is added
     tree_grm_estn               grm,
     tree                        t,
     cond                        c,
     plot                        p,
     pop_plot_stratum_assgn      ppsa,
     pop_stratum                 psm,
     pop_estn_unit               peu,
     pop_eval                    pev,
     pop_eval_typ                pet,
     pop_eval_grp                peg
 WHERE grm.estn_units = 'CF' -- cubic feet, added to filter tree_grm_estn table to single record
   AND grm.estn_type = 'AL' -- all live, added to filter tree_grm_estn table to single record
   AND grm.estimate = 'VOLUME' -- volume, added to filter tree_grm_estn table to single record
   AND grm.land_basis = 'FORESTLAND' -- forestland, added to filter tree_grm_estn table to single record
   AND t.cn = grm.tre_cn
   AND t.prevcond = c_past.condid
   AND p.prev_plt_cn = c_past.plt_cn
   AND t.condid = c.condid
   AND t.plt_cn = c.plt_cn
   AND c.plt_cn = p.cn
   AND p.cn = ppsa.plt_cn
   AND ppsa.stratum_cn = psm.cn
   AND psm.estn_unit_cn = peu.cn
   AND peu.eval_cn = pev.cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_typ = 'EXPREMV'
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272012
 GROUP BY c_past.stdszcd -- added to summarize estimate by past stdszcd
```

Example 4.23 produces the following estimate of removals of live trees on forest land by past stand-size class (cubic feet per year, description of code added for clarity):

PAST_STDSZCD	DESCRIPTION	ESTIMATE_IMPROVED
NULL	Nonforest	0
1	Large diameter stands	117,920,434
2	Medium diameter stands	98,051,092
3	Small diameter stands	4,873,376
5	Nonstocked stands	54,769
	SUM	**220,899,671**

The above results indicate that most removals took place on stands in the large and medium size classes.

CURRENT_STDSZCD	DESCRIPTION	ESTIMATE_IMPROVED
NULL	Nonforest	15,887,182
1	Large diameter stands	38,645,477
2	Medium diameter stands	20,640,662
3	Small diameter stands	140,389,536
5	Nonstocked stands	5,336,812
	SUM	**220,899,669**

Here are the removal estimates by current stand-size class, which is the size of the stand after the removals took place. This shows how much removal volume occurred on stands that are now in a nonforest condition (see net growth discussion in section 7.3 for detailed description), and the resulting stand-size class of the condition after the removals occurred on land that remained forestland.

There may be minor rounding differences between the sum of the subtotals from these scripts and the total removals from the script in example 4.22.

7.10 Removals estimation summarized by midpoint attributes

As discussed in the net growth accounting section 7.5, only two attributes are available to summarize by at the midpoint (diameter and stand age). The midpoint diameters are stored in TREE_GRM_ESTN.DIA_MIDPT. The midpoint stand age is derived by starting with the previous stand age and adding one-half of the remeasurement period between time 1 and time 2. Both of these attributes are usually assigned to broader classes such as a 2-inch diameter class and 5-, 10-, or 20-year age classes.

As in net growth accounting, the midpoint diameter may only be available for remeasured annual-to-annual inventory plots. In periodic inventories, the diameter may be the diameter at the estimated time of death/removal instead of the midpoint of the remeasurement period. For some periodic-to-periodic and periodic-to-annual inventories, the estimated midpoint diameter may be stored in TREE.DIA or TREE.DIACALC. If this is the case, the script below still can be modified by replacing “grm.dia_midpt” with “t.dia” or “t.diacalc” as appropriate.

Example 4.24 Estimate removals of live trees on forest land (cubic feet per year) by estimated midpoint diameter class

```
SELECT ((TRUNC(grm.dia_midpt / 2 + .5)) * 2) as dia_class, -- added to summarize mortality or
removals by the estimated midpoint diameter
      ROUND(SUM(psm.expns * grm.tparemv_unadj *
            DECODE(grm.subptyp_grm,
                  1,
                  psm.adj_factor_subp,
                  2,
                  psm.adj_factor_micr,
                  3,
                  psm.adj_factor_macr) * grm.removals)) AS estimate_improved
  FROM cond                     c_past, -- past condition is added
      tree_grm_estn             grm,
      tree                      t,
      cond                      c,
      plot                      p,
      pop_plot_stratum_assgn    ppsa,
      pop_stratum               psm,
      pop_estn_unit             peu,
      pop_eval                  pev,
      pop_eval_typ              pet,
      pop_eval_grp              peg
 WHERE grm.estn_units = 'CF' -- cubic feet, added to filter tree_grm_estn table to single record
   AND grm.estn_type = 'AL' -- all live, added to filter tree_grm_estn table to single record
   AND grm.estimate = 'VOLUME' -- volume, added to filter tree_grm_estn table to single record
   AND grm.land_basis = 'FORESTLAND' -- forestland, added to filter tree_grm_estn table to single
record
   AND t.cn = grm.tre_cn
   AND t.prevcond = c_past.condid
   AND p.prev_plt_cn = c_past.plt_cn
   AND t.condid = c.condid
   AND t.plt_cn = c.plt_cn
   AND c.plt_cn = p.cn
   AND p.cn = ppsa.plt_cn
   AND ppsa.stratum_cn = psm.cn
   AND psm.estn_unit_cn = peu.cn
   AND peu.eval_cn = pev.cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_typ = 'EXPREMV'
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272012
 GROUP BY ((TRUNC(grm.dia_midpt / 2 + .5)) * 2) -- added to summarize mortality or removals by
the estimated midpoint diameter
```

Example 4.24 produces the following estimate of removals of live trees on forest land by current stand-size class (cubic feet per year, description of code added for clarity):

DIA_CLASS	ESTIMATE_IMPROVED
6	21,999,995
8	37,476,353
10	42,184,310
12	39,208,314
14	30,457,413
16	20,117,366
18	10,167,625
20	7,334,237
22	5,448,706
24	2,041,319
26	1,421,702
28	369,630
30	699,062
36	534,069
42	1,439,570
SUM	**220,899,671**

7.11 Mortality estimation

Mortality estimation mirrors removals estimation in all respects. Modification of the example removals scripts to obtain mortality estimates is achieved by replacing the following:

tpamort_unadj for tparemv_unadj
t.fmortcfal for t.fremvcfal
grm.mortality for grm.removals
'EXPMORT' for 'EXPREMV'

7.12 The SUBP_COND_CHNG_MTRX (CMX) table

The SUBP_COND_CHNG_MTRX (CMX) table was added in the FIADB version 4.0 to facilitate the tracking of area change for the annual inventory. Under this design, a plot measures area change by tracking the movement in condition boundaries within the area of the four subplots. Figure 8 shows what can happen on a plot when a condition boundary (in this case the edge of a beaver pond) moves over time. Beaver activity raised the level of the pond, increasing the pond area and converting some of the forest land to water. The same kind of changes can occur from any number of human-caused events such as timber harvesting, land clearing or road construction, or natural events such as fire, storms, or insect attacks.

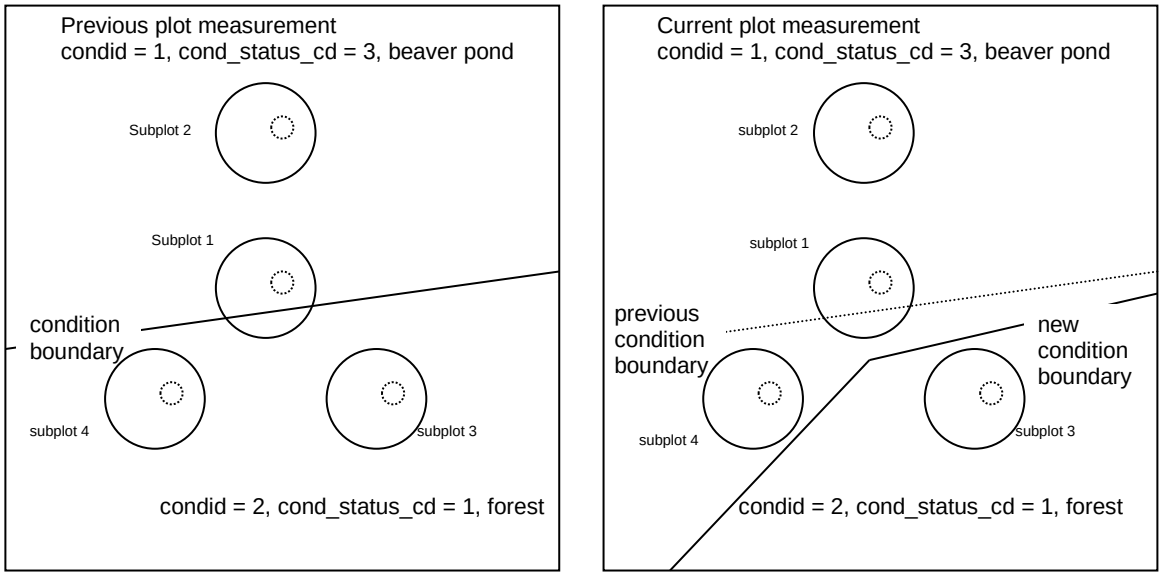


Figure 8. Example plot layout where condition boundaries changed between previous (left panel) and current plot measurements (right panel). The solid circles are the subplots and the smaller dashed circles are the microplots.

It is important to remember that condition boundaries are not just defined along changes in condition status code, but also may occur within forest land. The following tabulation shows how the area change information in figure 8 would be recorded in the CMX table.

CMX table data for figure 8

SUBP	SUBPTYP	CONDID	PREVCOND	SUBPTYP_PROP_CHNG
1	1	1	1	.8000
1	1	1	2	.2000
1	2	1	1	1.000
2	1	1	1	1.000
2	2	1	1	1.000
3	1	2	2	1.000
3	2	2	2	1.000
4	1	1	2	1.000
4	2	1	2	1.000

The CMX table tracks the change in condition areas for each of the four subplots (SUBPTYP = 1) and each of the four microplots (SUBPTYP = 2) on this plot. In inventories where the macroplot is used there would also be entries for each macroplot (SUBPTYP = 3). The attribute PROP_BASIS in the COND table identifies how area estimation was conducted for each plot, on the basis of either the macroplot or the subplot. In this example area estimation (and thus area change estimation) is based on the subplot information, not the macroplot. Area estimation is typically based on the largest area sampled (macroplot in States where it is measured, otherwise the subplot) and not on the microplot. Area and area change estimation based on the microplot is only appropriate with another estimate solely collected on the microplot such as number of trees or biomass in trees <5

inches diameter at breast height. The examples of change presented here are based on the subplot, but could easily be modified to obtain estimates based on the microplots.

In the example shown in figure 8, the CMX table has two entries where SUBPTYP = 1 and SUBP = 1. The first entry indicates that 80 percent of the subplot area was in condition 1 (water) at both measurements, and the second entry indicates 20 percent of the subplot area changed from forest to water. For the other three subplots and all four microplots, only one record exists, indicating that the entire subplot or microplot either stayed in the same condition (subplots and microplots 2 and 3) or the entire area changed from one condition to another (subplot and microplot 4). For this remeasured plot, change based on the four subplots is water to water 45 percent, forest to water 30 percent, and forest to forest 25 percent; change based on the four microplots is water to water 50 percent, forest to water 25 percent, and forest to forest 25 percent. The following section presents SQL script that produces these estimates.

7.13 Using the CMX table to estimate area change between two measurements

The estimation of area change over time requires linking past and current conditions through the CMX table to determine the portion of plot area that transitioned from conditions observed at time 1 to those observed at time 2 (methods applicable only between two measurements in the annual inventory).

We begin by modifying the script that produces the estimate of area of forest land so that it uses the area change evaluation EXPCHNG rather than the current area evaluation EXPCURR that is standard for area estimations. Example 4.25 shows this modification in bold.

Example 4.25 Estimate area of forest land (acres) based on the area change evaluation.

```
SELECT SUM(psm.expns * c.condprop_unadj *
        decode(c.prop_basis,
             'MACR',
             psm.adj_factor_macr,
             psm.adj_factor_subp) -- expression from ref_pop_attribute table
        ) estimate
  FROM cond                    c,
       plot                    p,
       pop_plot_stratum_assgn ppsa,
       pop_stratum             psm,
       pop_estn_unit           peu,
       pop_eval                pev,
       pop_eval_grp            peg,
       pop_eval_typ            pet
 WHERE p.cn = c.plt_cn
   and pet.eval_typ = 'EXPCHNG'
   AND c.cond_status_cd = 1 -- additional where_clause from ref_pop_attribute table
   AND ppsa.plt_cn = p.cn
   AND ppsa.stratum_cn = psm.cn
   AND peu.cn = psm.estn_unit_cn
   AND pev.cn = peu.eval_cn
   AND pev.cn = pet.eval_cn
   AND pet.eval_grp_cn = peg.cn
   AND peg.eval_grp = 272007 -- the desired evaluation group must be specified
```

The remeasured plots (12,280 plots) associated with EXPCHNG produce an area estimate of 16,962,397.2 acres of forest land versus 16,723,532.5 provided by EXCURR using all plots (17,855 plots). Both estimates of forest area are valid; however, only the one based on the remeasurement sample can be broken down into two points in time.

To estimate area change over time, the script has been further modified to link past and current condition records through the CMX table. This table has entries for every subplot on a remeasured plot and stores the proportion of the area of each subplot by the two points in time in the attribute CMX.SUBTYP_PROP_CHNG. Again, changes and additions from example 4.25 are shown in bold. Line numbers are for reference purposes.

Example 4.25 Estimate area change (acres) by condition status and stand size at two points in time, Minnesota, time 1 from 1999-2002 and time 2 from 2003-2007

1	SELECT **c_past.cond_status_cd past_cond_status_cd,**
2	**c_past.stdszcd past_stdszcd,**
3	**c.cond_status_cd current_cond_status_cd,**
4	**c.stdszcd current_stdszcd,**
5	SUM(psm.expns * **cmx.subptyp_prop_chng / 4 ***
6	decode(c.prop_basis,
7	'MACR',
8	psm.adj_factor_macr,
9	psm.adj_factor_subp) -- *expression from ref_pop_attribute table*
10	) estimate,
11	**count(*) COUNT,**
12	**SUM(cmx.subptyp_prop_chng / 4) plot_area**
13	FROM cond c,
14	plot p,
15	pop_plot_stratum_assgn ppsa,
16	pop_stratum psm,
17	pop_estn_unit peu,
18	pop_eval pev,
19	pop_eval_typ pet,
20	pop_eval_grp peg,
21	**cond c_past,**
22	**subp_cond_chng_mtrx cmx**
23	WHERE p.cn = c.plt_cn
24	AND pet.eval_typ = 'EXPCHNG'
25	**AND (c.cond_status_cd = 1 or c_past.cond_status_cd = 1)**
26	AND ppsa.plt_cn = p.cn
27	AND ppsa.stratum_cn = psm.cn
28	AND peu.cn = psm.estn_unit_cn
29	AND pev.cn = peu.eval_cn
30	AND pev.cn = pet.eval_cn
31	AND pet.eval_grp_cn = peg.cn
32	AND peg.eval_grp = 272007 -- *the desired evaluation group must be specified*
33	**AND p.prev_plt_cn = c_past.plt_cn**
34	**AND cmx.prev_plt_cn = c_past.plt_cn**
35	**AND cmx.prevcond = c_past.condid**
36	**AND cmx.condid = c.condid**
37	**AND ((cmx.subptyp = 3 and c.prop_basis = 'MACR') or**

```
38      (cmx.subptyp = 1 and c.prop_basis = 'SUBP'))
39  group by c_past.cond_status_cd,
40           c_past.stdszcd,
41           c.cond_status_cd,
42           c.stdszcd
```

Example 4.25 can be used as a template to create almost any cross tabulation of past and current area estimates based on a remeasured set of plots. The following changes (bold sections) were made to example 4.14 to facilitate the estimation of area change:

- Line 21 – The table **COND** with the alias **C_PAST** was added to the list of tables to be joined. This provides the condition level attributes for the past (time 1) measurement of the plot.

- Line 22 – The table **SUBP_COND_CHG_MTRX** with the alias **CMX** was added to the list of tables to be joined. This table provides the link between past (time 1) and current (time 2) conditions at the subplot level. Each entry in this table defines the portion (0-1) of the subplot, microplot or macroplot that was observed in a condition at time 2 and observed in a condition at time 1. For a subplot that was entirely in a single condition at both times, there will only be one entry for the subplot, with CMX.SUBPTYP_PROP_CHNG = 1.0. For a subplot that was mapped to be 40 percent in one condition and 60 percent in another condition at both times with no change in boundary, there will be two entries for the subplot, one with CMX.SUBPTYP_PROP_CHNG = 0.4 and the other with CMX.SUBPTYP_PROP_CHNG = 0.6. For subplots where boundaries have changed, there will be entries that account for all the pieces of the subplot area with the total value of CMX.SUBPTYP_PROP_CHNG adding to 1.0.

- Lines 1-4 and 39-42 – As in example 4.13, past and current condition status and stand-size class codes **(group by c_past.cond_status_cd, c_past.stdszcd, c.cond_status_cd, c.stdszcd)** were grouped to obtain estimate breakdowns by these attributes.

- Line 5 – **c.condprop_unadj** (the total plot condition proportions that are within a specific condition) was replaced with **cmx.subptyp_prop_chng / 4** (the subplot condition proportion divided by the number of subplots in the plot). The division by 4 is required because the **CMX** table tracks area at the subplot level (4 subplots per plot).

- Line 25 – The restrictions were changed in the where clause from **AND c.cond_status_cd = 1** to **AND (c.cond_status_cd = 1 or c_past.cond_status_cd = 1),** to select conditions that were forest in at least one of the measurements, not just the current measurement. This query tracks the area of land that moves in and out of forest, as well as changes in stand-size class on land that remains forest.

- Lines 33-38 – These additions to the where clause provide the proper links to the **C_PAST** and **CMX** tables that were added to the table list. Line 33 (**AND p.prev_plt_cn = c_past.plt_cn)** matches the past and current condition records to the same plot, and lines 34-38 provide the other restrictions that link the appropriate conditions at the two measurements through the **CMX** table. Lines 37 and 38 ensure that in inventories where area estimates are

based on the macroplot observations, the area change estimates are based on the macroplot observations, and in all other cases the estimates are based on the subplot observations.

- Lines 11 and 12 – **count(*) COUNT** and **SUM(CMX.subptyp_prop_chng / 4) PLOT_AREA** provide two additional summary attributes along with the area estimates. **COUNT** is the total number of subplot pieces that is tracked in the estimation. **PLOT_AREA** is the total portion of plots that is tracked in the estimation.

Example 4.25 produces the following estimates of total area (ESTIMATE), total number of subplots (COUNT), and total portion of plots (PLOT_AREA) broken down by past and current COND_STATUS_CD and STDSZCD values, for land that was forest at measurement time 1, measurement time 2, or both.

PAST_COND_ STATUS_CD	PAST_ STDSZCD	CURRENT_ STATUS_CD	CURRENT_ STDSZCD	ESTIMATE	COUNT	PLOT_AREA
1	1	1	1	3,631,160.4	3208	767.8
1	1	1	2	291,277.3	274	63.1
1	1	1	3	390,763.5	360	83.0
1	1	1	5	58,700.4	53	12.0
1	1	2		70,387.0	117	15.2
1	1	3		3,961.3	10	0.8
1	1	4		2,892.6	9	0.6
1	1	5		2,289.7	2	0.5
1	2	1	1	786,401.0	709	167.1
1	2	1	2	4,648,293.5	4160	996.0
1	2	1	3	620,036.7	571	132.4
1	2	1	5	46,356.9	46	10.2
1	2	2		84,928.1	133	18.8
1	2	3		1,990.6	6	0.4
1	2	4		895.2	1	0.2
1	3	1	1	158,110.2	151	32.5
1	3	1	2	648,108.5	604	138.3
1	3	1	3	4,243,065.9	3884	934.6
1	3	1	5	61,623.3	56	13.1
1	3	2		98,616.9	126	21.4
1	3	3		12,348.1	11	2.1
1	3	4		4,707.5	4	1.0
1	5	1	1	16,820.1	18	3.7
1	5	1	2	18,273.1	20	4.2
1	5	1	3	95,244.4	94	21.5
1	5	1	5	61,597.5	59	14.2
1	5	2		55,411.0	53	11.9
1	5	3		549.8	1	0.1
1	5	5		2,814.4	2	0.5
2		1	1	234,236.1	288	50.7
2		1	2	267,173.3	326	59.6

PAST_COND_ STATUS_CD	PAST_ STDSZCD	CURRENT_ STATUS_CD	CURRENT_ STDSZCD	ESTIMATE	COUNT	PLOT_AREA
2		1	3	556,373.0	564	126.3
2		1	5	48,463.7	51	11.0
3		1	1	14,427.4	19	3.1
3		1	2	9,767.2	13	2.3
3		1	3	21,966.0	21	4.3
3		1	5	1,225.5	2	0.3
4		1	1	17,585.0	19	4.0
4		1	2	4,149.1	10	0.9
4		1	3	8,858.1	9	2.0
5		1	1	2,339.8	2	0.5

These results are used to produce the following tabulation of estimated change in forest area by condition status code and stand-size class at two points in time.

Table. 4.22. Estimated forest land area broken down by past and current condition status code and stand-size class, Minnesota, 2007 (acres)

		CURRENT_COND_STATUS_CD									Total
		1 Forest land CURRENT_STDSZCD				Total	2 Nonforest land	3 Noncensus water	4 Census water	5 Nonsampled	
PAST_COND_ STATUS_CD	PAST_ STDSZCD	1 Large diameter	2 Medium diameter	3 Small diameter	5 Non-stocked						
1 Forest land	1 Large diameter	3,631,160.4	291,277.3	390,763.5	58,700.4	4,371,901.6	70,387.0	3,961.3	2,892.6	2,289.7	4,451,432.2
	2 Medium diameter	786,401.0	4,648,293.5	620,036.7	46,356.9	6,101,088.1	84,928.1	1,990.6	895.2		6,188,902.0
	3 Small diameter	158,110.2	648,108.5	4,243,065.9	61,623.3	5,110,907.8	98,616.9	12,348.1	4,707.5		5,226,580.4
	5 Nonstocked	16,820.1	18,273.1	95,244.4	61,597.5	191,935.1	55,411.0	549.8		2,814.4	250,710.3
Total forest land		4,592,491.7	5,605,952.3	5,349,110.6	228,278.0	15,775,832.6	309,343.1	18,849.8	8,495.3	5,104.1	16,117,624.8
2 Nonforest land		234,236.1	267,173.3	556,373.0	48,463.7	1,106,246.1					1,106,246.1
3 Noncensus water		14,427.4	9,767.2	21,966.0	1,225.5	47,386.1					47,386.1
4 Census water		17,585.0	4,149.1	8,858.1		30,592.1					30,592.1
5 Nonsampled		2,339.8				2,339.8					2,339.8
Total		4,861,080.0	5,887,041.9	5,936,307.6	277,967.2	16,962,396.8	309,343.1	18,849.8	8,495.3	5,104.1	17,304,189.0

Note: Includes lands classified as forest at either or both measurements. Based on plots first measured in 1999-2002 and remeasured in 2003-2007.

The total current forest land area in the table above (16,962,396.8 acres) matches (within 1 acre) the results we obtained in example 4.14 (16,962,397.2 acres). The difference between these two estimates is simply the rounding error introduced by storing and computing condition proportions for each of the individual subplot sections in **cmx.subptyp_prop_chng** versus the total condition proportion in **c.condprop_unadj**. The total past forest land area in the tabulation above (16,117,624.8 acres) is based on the same remeasured plots and comes close, but does not match the 2003 estimate of forest land area (16,230,325.3 acres) one obtains when using example 4.25 and setting pet.eval_typ='EXPCURR' and pop_eval_grp.eval_grp = 272003.

The COUNT and PLOT_AREA values provide data users with the number of measurements associated with each estimate, giving users some information about the reliability of the estimates. For example, conditions that remained as large diameter (COND.STDSZCD equals 1) from time 1 to time 2 had an area estimate of 3,631,160.4 acres at time 2. From time 1 to time 2, 3,208 subplots or portions of subplots maintained their large diameter condition. These subplots or portions of subplots represent an area equivalent to 767.8 total plots. The estimates are based on a considerable number of observations. In contrast, if one is interested in tracking area of water (either census or noncensus water) that converts to or from forest land over time, estimates are based on far fewer observed changes. The estimated area that changed from water (COND.COND_STATUS_CD equals 3 or 4) to forest (COND.COND_STATUS_CD equals 1) is 77,978.2 acres, and the estimated change from forest to water is 27,345.1 acres. The water to forest change is based on observations from 93 subplots where at least a portion of the subplot was observed to change from water to forest. The total area of this observed change is equal to 16.8 plots. The change from forest to water estimate (27,345.1 acres) is based on 42 subplot observations over an area equivalent to 5.2 plots.

Example 4.27 presents sampling errors for the forest to water area change estimate. This script was created from the script presented in example 4.7 with modifications similar to those made in example 4.15. The bold sections indicate where changes were made. The addition of the following code to the where clause restricts the estimation to conditions that change from forest (c_past.cond_status_cd = 1) to water (c.cond_status_cd IN (3,4)):

AND (c.cond_status_cd IN (3,4) AND c_past.cond_status_cd = 1).

Further modifications to this example were made to produce estimates and sampling errors for the water to forest area change and for areas that remained as large diameter conditions as discussed in the previous paragraph. The results are presented in the tabulation that follows example 4.27. Users will note that the sampling errors for the estimates of forest to water and water to forest area change are quite high (29.2 percent and 18.4 percent, respectively) and the sampling error on conditions remaining large diameter is fairly low (2.9 percent). To obtain other area change and sampling error estimates, users should modify the where clause and eval_grp.

Example 4.27. Estimate area change from forest (cond_status_cd equals 1) to water (cond_status_cd equals 3 or 4) with sampling error. Based on the Minnesota 2007 remeasurement sample (Note the bold sections in this example indicate where changes in code from example 4.7 were made.)

```
SELECT eval_grp,
    SUM(estimate_by_estn_unit.estimate) estimate,
    CASE
```

```
      WHEN SUM(estimate_by_estn_unit.estimate) > 0 THEN
       round(sqrt(SUM(estimate_by_estn_unit.var_of_estimate)) /
            SUM(estimate_by_estn_unit.estimate) * 100,
            3)
      ELSE
       0
     END AS se_of_estimate_pct,
     SUM(estimate_by_estn_unit.var_of_estimate) var_of_estimate,
     SUM(estimate_by_estn_unit.total_plots) total_plots,
     SUM(estimate_by_estn_unit.non_zero_plots) non_zero_plots,
     SUM(estimate_by_estn_unit.total_population_area_acres) total_population_acres
FROM (SELECT pop_eval_grp_cn,
          eval_grp,
          estn_unit_cn,
          sum(nvl(ysum_hd, 0) * phase_1_summary.expns) estimate,
          SUM(phase_1_summary.n_h) total_plots,
          SUM(phase_2_summary.number_plots_in_domain) domain_plots,
          SUM(phase_2_summary.non_zero_plots) non_zero_plots,
          total_area * total_area / SUM(phase_1_summary.n_h) *
          ((SUM(w_h * phase_1_summary.n_h *
              (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
              ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
              (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
              (phase_1_summary.n_h - 1)))) +
          1 / SUM(phase_1_summary.n_h) *
          (SUM((1 - w_h) * phase_1_summary.n_h *
              (((nvl(ysum_hd_sqr, 0) / phase_1_summary.n_h) -
              ((nvl(ysum_hd, 0) / phase_1_summary.n_h) *
              (nvl(ysum_hd, 0) / phase_1_summary.n_h))) /
              (phase_1_summary.n_h - 1))))) var_of_estimate,
          total_area total_population_area_acres
       FROM (SELECT peg.eval_grp,
                peg.cn pop_eval_grp_cn,
                psm.estn_unit_cn,
                psm.cn pop_stratum_cn,
                psm.expns,
                p1pointcnt /
                (SELECT SUM(strs.p1pointcnt)
                   FROM pop_stratum strs
                  WHERE strs.estn_unit_cn = psm.estn_unit_cn) w_h,
                (SELECT SUM(strs.p1pointcnt)
                   FROM pop_stratum strs
                  WHERE strs.estn_unit_cn = psm.estn_unit_cn) n_prime,
                p1pointcnt n_prime_h,
                (SELECT SUM(eu_s.area_used)
                   FROM pop_estn_unit eu_s
                  WHERE eu_s.cn = psm.estn_unit_cn) total_area,
                psm.p2pointcnt n_h
             FROM pop_estn_unit peu,
                pop_stratum         psm,
                pop_eval            pev,
                pop_eval_grp        peg,
                pop_eval_typ        pet
            WHERE peu.cn = psm.estn_unit_cn
              AND pev.cn = peu.eval_cn
              AND pet.eval_cn = pev.cn
              AND pet.eval_grp_cn = peg.cn
```

```
            AND pet.eval_typ = 'EXPCHNG' -- expansion factor area change estimation
            AND peg.eval_grp = 272007 -- desired evaluation group must be specified
          ) phase_1_summary,
          (SELECT pop_stratum_cn,
                SUM(y_hid_adjusted) ysum_hd,
                SUM(y_hid_adjusted * y_hid_adjusted) ysum_hd_sqr,
                COUNT(*) number_plots_in_domain,
                SUM(decode(y_hid_adjusted, 0, 0, NULL, 0, 1)) non_zero_plots
            FROM (SELECT psm.cn pop_stratum_cn,
                      p.cn plt_cn,
                      SUM(cmx.subptyp_prop_chng / 4 *
                         decode(c.prop_basis,
                              'MACR',
                              psm.adj_factor_macr,
                              psm.adj_factor_subp) -- expression for proportion of tracked plots
                         ) y_hid_adjusted
                    FROM cond                    c,
                      plot                       p,
                      pop_plot_stratum_assgn     ppsa,
                      pop_stratum                psm,
                      pop_estn_unit              peu,
                      pop_eval                   pev,
                      pop_eval_typ               pet,
                      pop_eval_grp               peg,
                      cond                       c_past,
                      subp_cond_chng_mtrx        cmx
                    WHERE p.cn = c.plt_cn
                      AND pet.eval_typ = 'EXPCHNG'
                      AND (c.cond_status_cd IN (3, 4) AND c_past.cond_status_cd = 1)
                          -- where clause tracking change
                      AND ppsa.plt_cn = p.cn
                      AND ppsa.stratum_cn = psm.cn
                      AND peu.cn = psm.estn_unit_cn
                      AND pev.cn = peu.eval_cn
                      AND pev.cn = pet.eval_cn
                      AND pet.eval_grp_cn = peg.cn
                      AND peg.eval_grp = 272007 -- desired evaluation group must be specified
                      AND p.prev_plt_cn = c_past.plt_cn
                      AND cmx.prev_plt_cn = c_past.plt_cn
                      AND cmx.prevcond = c_past.condid
                      AND cmx.condid = c.condid
                      AND ((cmx.subptyp = 3 and c.prop_basis = 'MACR') or
                         (cmx.subptyp = 1 and c.prop_basis = 'SUBP'))
                             -- join past conditions / change matrix table
                    GROUP BY psm.cn, p.cn)
              GROUP BY pop_stratum_cn) phase_2_summary
        WHERE phase_1_summary.pop_stratum_cn =
            phase_2_summary.pop_stratum_cn(+)
        GROUP BY pop_eval_grp_cn,
              eval_grp,
              estn_unit_cn,
              phase_1_summary.total_area) estimate_by_estn_unit
GROUP BY pop_eval_grp_cn, eval_grp
```

Results of Example 4.27:

Area change estimates and sampling errors based on remeasured plots, Minnesota, 2007.

	Forest to water	Water to forest	Large diameter forest at both measurements
Changes to where clause	AND (c.cond_status_cd IN (3,4) AND c_past.cond_status_cd = 1)	AND (c.cond_status_cd=1 AND c_past.cond_status_cd IN (3,4))	AND (c.cond_status_cd=1 AND c_past.cond_status_cd=1 AND C.STDSZCD = 1 AND c_past.STDSZCD = 1)
EVAL_GRP	272007	272007	272007
ESTIMATE	27,345.1	77,978.2	3,631,160.4
SE_OF_ESTIMATE_PCT	29.2	18.4	2.9
VAR_OF_ESTIMATE	63,796,853	206,390,712	11,427,498,039
TOTAL_PLOTS	12,280	12,280	12,280
NON_ZERO_PLOTS	32	57	1,007
TOTAL_POPULATION_ ACRES	54,008,479	54,008,479	54,008,479

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Appendix A. Index of Column Names

The following table lists column names used in the database tables, their location within the table, and a short description.

Column name with (field guide section)	Table name	Location in table	Description
ABBR	REF_FOREST_TYPE_GROUP	3	Abbreviation
ACTUALHT (5.15)	TREE	22	Actual height of tree
ADFORCD	COND	15	Administrative forest code
ADFORCD	PLOTGEOM	21	Administrative forest code
ADJ_EXPALL	PLOTSNAP	58	Adjustment factor for all land area
ADJ_EXPCURR	PLOTSNAP	59	Adjustment factor for forest land and timberland area
ADJ_EXPGROW_MACR	PLOTSNAP	63	Macroplot adjustment factor for growth estimation
ADJ_EXPGROW_MICR	PLOTSNAP	65	Microplot adjustment factor for growth estimation
ADJ_EXPGROW_SUBP	PLOTSNAP	64	Subplot adjustment factor for growth estimation
ADJ_EXPMORT_MACR	PLOTSNAP	66	Macroplot adjustment factor for mortality estimation
ADJ_EXPMORT_MICR	PLOTSNAP	68	Microplot adjustment factor for mortality estimation
ADJ_EXPMORT_SUBP	PLOTSNAP	67	Subplot adjustment factor for mortality estimation
ADJ_EXPREMV_MACR	PLOTSNAP	69	Macroplot adjustment factor for removals estimation
ADJ_EXPREMV_MICR	PLOTSNAP	71	Microplot adjustment factor for removals estimation
ADJ_EXPREMV_SUBP	PLOTSNAP	70	Subplot adjustment factor for removals estimation
ADJ_EXPVOL_MACR	PLOTSNAP	60	Macroplot adjustment factor for volume estimation
ADJ_EXPVOL_MICR	PLOTSNAP	62	Microplot adjustment factor for volume estimation
ADJ_EXPVOL_SUBP	PLOTSNAP	61	Subplot adjustment factor for volume estimation
ADJ_FACTOR_CWD	POP_STRATUM	15	Adjustment factor for coarse woody debris
ADJ_FACTOR_DUFF	POP_STRATUM	18	Adjustment factor for the duff and litter layer
ADJ_FACTOR_FWD_LG	POP_STRATUM	17	Adjustment factor for large fine woody debris

Column name with (field guide section)	Table name	Location in table	Description
ADJ_FACTOR_FWD_SM	POP_STRATUM	16	Adjustment factor for small fine woody debris
ADJ_FACTOR_MACR	POP_STRATUM	12	Adjustment factor for the macroplot
ADJ_FACTOR_MICR	POP_STRATUM	14	Adjustment factor for the microplot
ADJ_FACTOR_SUBP	POP_STRATUM	13	Adjustment factor for the subplot
ADMIN_WITHDRAWN_CD	COND	104	Administratively withdrawn code
AFFORESTATION_CD (2.5.34)	COND	107	Current afforestation code
AGEDIA (7.2.5)	SITETREE	14	Age at diameter height
AGENTCD (5.21)	TREE	27	Cause of death (agent) code
ALLOWED_IN_FIELD	REF_FOREST_TYPE	6	Allowed in field
ALSTK	COND	53	All-live-tree stocking percent
ALSTKCD	COND	37	All live stocking code
ANN_INVENTORY	SURVEY	8	Annual inventory
ANN_NET_GROWTH	TREE_GRM_ESTN	16	Average annual net growth estimate
AREA_SOURCE	POP_ESTN_UNIT	11	Source of area figures usually Census Bureau or from pixel counts
AREA_USED	POP_ESTN_UNIT	10	Area used to calculate all expansion factors
AREALAND_EU	POP_ESTN_UNIT	8	Land area within the estimation unit
AREATOT_EU	POP_ESTN_UNIT	9	Total area within the estimation unit
ASPECT	COND	34	Aspect
ASPECT (3.7)	SUBPLOT	17	Subplot aspect
ATTRIBUTE_DESCR	REF_POP_ATTRIBUTE	3	Estimation attribute e.g., Area of timberland
ATTRIBUTE_GLOSSARY	REF_POP_ATTRIBUTE	9	Attribute glossary
ATTRIBUTE_NBR	POP_EVAL_ATTRIBUTE	3	Attribute number
ATTRIBUTE_NBR	REF_POP_ATTRIBUTE	2	Arbitrary unique number
AUTHOR	REF_HABTYP_PUBLICATION	4	Author of publication
AVG_WOOD_DENSITY	COND_DWM_CALC	96	Average wood density
AZIMUTH	DWM_RESIDUAL_PILE	12	Azimuth
AZIMUTH (7.2.8)	SITETREE	19	Azimuth
AZIMUTH (5.4)	TREE	12	Azimuth
AZMCORN (4.2.6)	BOUNDARY	13	Corner azimuth
AZMLEFT (4.2.5)	BOUNDARY	12	Left azimuth
AZMRIGHT (4.2.8)	BOUNDARY	15	Right azimuth
BALIVE	COND	51	Basal area of live trees
BARK_SPGR_GREENVOL_ DRYWT	REF_SPECIES	49	Green specific gravity bark (green volume and oven-dry weight)
BARK_SPGR_GREENVOL_ DRYWT_CIT	REF_SPECIES	50	Green specific gravity bark citation

Column name with (field guide section)	Table name	Location in table	Description
BARK_VOL_PCT	REF_SPECIES	57	Bark volume as a percent of wood volume
BARK_VOL_PCT_CIT	REF_SPECIES	58	Bark volume as a percent of wood volume citation
BFSND	TREE	73	Board-foot-cull soundness
BHAGE	TREE	66	Breast height age
BNDCHG (4.2.3)	BOUNDARY	10	Boundary change code
BOLEHT	TREE	76	Bole height
BORED_CD_PNWRS	TREE	125	Tree bored code, Pacific Northwest Research Station
C	TREE_GRM_ESTN	34	Cut
C_SPGRPCD	REF_SPECIES	10	Caribbean species group code
CANOPY_CVR_SAMPLE_METHOD_CD	COND	97	Canopy cover sample method code
CARIBBEAN	REF_SPECIES	30	Caribbean species
CARBON	DWM_COARSE_WOODY_DEBRIS	24	Carbon biomass of coarse woody debris piece
CARBON	DWM_RESIDUAL_PILE	22	Carbon mass
CARBON_AG	TREE	121	Carbon aboveground
CARBON_BG	TREE	122	Carbon belowground
CARBON_DOWN_DEAD	COND	67	Carbon in down dead
CARBON_LITTER	COND	68	Carbon in litter
CARBON_SOIL_ORG	COND	69	Carbon in soil fine organic material
CARBON_STANDING_DEAD	COND	70	Carbon in standing dead trees
CARBON_UNDERSTORY_AG	COND	71	Carbon in the aboveground portions of seedlings and woody shrubs
CARBON_UNDERSTORY_BG	COND	72	Carbon in the belowground portion of seedlings and woody shrubs
CATEGORY	REF_PLANT_DICTIONARY	8	Category
CCLCD (5.17)	TREE	25	Crown class code
CD	TREE_GRM_ESTN	40	Cull decrement
CDENCD (12.9)	TREE	61	Crown density code
CDIEBKCD (12.10)	TREE	62	Crown dieback code
CFSND	TREE	74	Cubic-foot-cull soundness
CHANGE_EVAL_TYPE	REF_POP_EVAL_TYP_DESCR	5	Change evaluation type
CHAINING_CD (2.5.37)	COND	105	Chaining code
CHRCD_PNWRS	DWM_COARSE_WOODY_DEBRIS	33	Charred code, Pacific Northwest Research Station
CI	TREE_GRM_ESTN	42	Cull increment
CITATION	REF_CITATION	2	Citation
CITATION_NBR	REF_CITATION	1	Citation number
CLASS	REF_SPECIES_GROUP	4	Class
CLIGHTCD (12.6)	TREE	59	Crown light exposure code
CN	BOUNDARY	1	Sequence number

Column name with (field guide section)	Table name	Location in table	Description
CN	COND	1	Sequence number
CN	COND_DWM_CALC	1	Sequence number
CN	COUNTY	5	Sequence number
CN	DWM_COARSE_WOODY_ DEBRIS	1	Sequence number
CN	DWM_DUFF_LITTER_FUEL	1	Sequence number
CN	DWM_FINE_WOODY DEBRIS	1	Sequence number
CN	DWM_MICROPLOT_FUEL	1	Sequence number
CN	DWM_RESIDUAL_PILE	1	Sequence number
CN	DWM_TRANSECT_SEGMENT	1	Sequence number
CN	DWM_VISIT	1	Sequence number
CN	INVASIVE_SUBPLOT_SPP	1	Sequence number
CN	P2VEG_SUBP_STRUCTURE	1	Sequence number
CN	P2VEG_SUBPLOT_SPP	1	Sequence number
CN	PLOT	1	Sequence number
CN	PLOTGEOM	1	Sequence number
CN	PLOTSNAP	1	Sequence number
CN	POP_ESTN_UNIT	1	Sequence number
CN	POP_EVAL	1	Sequence number
CN	POP_EVAL_ATTRIBUTE	1	Sequence number
CN	POP_EVAL_GRP	1	Sequence number
CN	POP_EVAL_TYP	1	Sequence number
CN	POP_PLOT_STRATUM_ ASSGN	1	Sequence number
CN	POP_STRATUM	1	Sequence number
CN	REF_HABTYP_DESCRIPTION	1	Sequence number
CN	REF_HABTYP_PUBLICATION	1	Sequence number
CN	REF_INVASIVE_SPECIES	1	Sequence number
CN	REF_PLANT_DICTIONARY	1	Sequence number
CN	REF_POP_ATTRIBUTE	1	Sequence number
CN	REF_POP_EVAL_TYP_DESCR	1	Sequence number
CN	SEEDLING	1	Sequence number
CN	SITETREE	1	Sequence number
CN	SUBPLOT	1	Sequence number
CN	SUBP_COND	1	Sequence number
CN	SUBP_COND_CHNG_MTRX	1	Sequence number
CN	SURVEY	1	Sequence number
CN	TREE	1	Sequence number
CN	TREE_GRM_ESTN	1	Sequence number
CND_CN	COND_DWM_CALC	10	Condition sequence number
COMMON_NAME	REF_HABTYP_DESCRIPTION	5	Common name
COMMON_NAME	REF_PLANT_DICTIONARY	7	Common name
COMMON_NAME	REF_SPECIES	2	Common name of species
COMPONENT	TREE_GRM_ESTN	10	Growth component type
COND_NONSAMPLE_REASN_ CD (2.4.3)	COND	10	Condition nonsampled reason code
COND_STATUS_CD (2.4.2)	COND	9	Condition status code
CONDID (2.4.1)	COND	8	Condition class number
CONDID	COND_DWM_CALC	7	Condition class number
CONDID	DWM_COARSE_WOODY_ DEBRIS	11	Condition class number

Column name with (field guide section)	Table name	Location in table	Description
CONDID	DWM_DUFF_LITTER_FUEL	12	Condition class number
CONDID	DWM_FINE_WOODY DEBRIS	9	Condition class number
CONDID	DWM_RESIDUAL_PILE	10	Condition class number
CONDID	DWM_TRANSECT_SEGMENT	11	Condition class number
CONDID (9.8)	INVASIVE_SUBPLOT_SPP	9	Condition class number
CONDID (8.4.4)	P2VEG_SUBP_STRUCTURE	9	Condition class number
CONDID (8.4.4)	P2VEG_SUBPLOT_SPP	9	Condition class number
CONDID (6.3)	SEEDLING	9	Condition class number
CONDID	SITETREE	9	Condition class number
CONDID	SUBP_COND	9	Condition class number
CONDID	SUBP_COND_CHNG_MTRX	6	Condition class number
CONDID (5.3)	TREE	11	Condition class number
CONDLIST	SUBPLOT	15	Subplot/macroplot plot condition list
CONDLIST	SITETREE	24	Condition class list
CONDPROP_CWD	COND_DWM_CALC	13	Proportion of coarse woody debris transects in the condition
CONDPROP_DUFF	COND_DWM_CALC	17	Proportion of sample points used to measure duff, litter, and fuelbed, in the condition
CONDPROP_FWD_LG	COND_DWM_CALC	16	Proportion of fine woody debris transects used to sample large-sized pieces, in the condition
CONDPROP_FWD_MD	COND_DWM_CALC	15	Proportion of fine woody debris transects used to sample medium-sized pieces, in the condition
CONPROP_FWD_SM	COND_DWM_CALC	14	Proportion of fine woody debris transects used to sample small-sized pieces, in the condition
CONDPROP_UNADJ	COND	29	Condition proportion unadjusted
CONGCD	PLOT	28	Congressional district code
CONGCD	PLOTGEOM	9	Congressional district code
CONGCD	PLOTSNAP	28	Congressional district code
CONTRAST (4.2.4)	BOUNDARY	11	Contrasting condition
CORE	REF_SPECIES	27	Core
COUNTYCD	BOUNDARY	6	County code
COUNTYCD	COND	6	County code
COUNTYCD	COND_DWM_CALC	3	County code
COUNTYCD	COUNTY	3	County code
COUNTCD	DWM_COARSE_WOODY_ DEBRIS	5	County code
COUNTYCD	DWM_DUFF_LITTER_FUEL	5	County code
COUNTYCD	DWM_FINE_WOODY DEBRIS	5	County code
COUNTYCD	DWM_MICROPLOT_FUEL	5	County code
COUNTYCD	DWM_RESIDUAL_PILE	5	County code
COUNTYCD	DWM_TRANSECT_SEGMENT	5	County code

Column name with (field guide section)	Table name	Location in table	Description
COUNTYCD	DWM_VISIT	5	County code
COUNTYCD	INVASIVE_SUBPLOT_SPP	6	County code
COUNTYCD	P2VEG_SUBP_STRUCTURE	5	County code
COUNTYCD	P2VEG_SUBPLOT_SPP	6	County code
COUNTYCD (1.2)	PLOT	8	County code
COUNTYCD	PLOTGEOM	5	County code
COUNTYCD	PLOTSNAP	8	County code
COUNTYCD	POP_PLOT_STRATUM_ ASSGN	7	County code
COUNTYCD	SEEDLING	6	County code
COUNTYCD	SITETREE	7	County code
COUNTYCD	SUBPLOT	7	County code
COUNTYCD	SUBP_COND	6	County code
COUNTYCD	TREE	7	County code
COUNTYNM	COUNTY	4	County name
COVER_PCT	DWM_COARSE_WOODY_ DEBRIS	25	Percent cover represented by each coarse woody debris piece, core design
COVER_PCT (9.11)	INVASIVE_SUBPLOT_SPP	12	Cover percent
COVER_PCT	P2VEG_SUBP_STRUCTURE	12	Cover percent
COVER_PCT (8.6.4)	P2VEG_SUBPLOT_SPP	15	Cover percent
COVER_PCT_RGN	DWM_COARSE_WOODY_ DEBRIS	32	Percent cover represented by the log for P2 regional designs
CPOSCD (12.7)	TREE	58	Crown position code
CR (5.19)	TREE	24	Compacted crown ratio
CREATED_BY	BOUNDARY	18	Created by
CREATED_BY	COND	73	Created by
CREATED_BY	COND_DWM_CALC	97	Created by
CREATED_BY	COUNTY	6	Created by
CREATED_BY	INVASIVE_SUBPLOT_SPP	13	Created by
CREATED_BY	DWM_COARSE_WOODY_ DEBRIS	35	Created by
CREATED_BY	DWM_DUFF_LITTER_FUEL	16	Created by
CREATED_BY	DWM_FINE_WOODY DEBRIS	25	Created by
CREATED_BY	DWM_MICROPLOT_FUEL	18	Created by
CREATED_BY	DWM_RESIDUAL_PILE	26	Created by
CREATED_BY	DWM_TRANSECT_SEGMENT	18	Created by
CREATED_BY	DWM_VISIT	13	Created by
CREATED_BY	P2VEG_SUBP_STRUCTURE	13	Created by
CREATED_BY	P2VEG_SUBPLOT_SPP	16	Created by
CREATED_BY	PLOT	33	Created by
CREATED_BY	PLOTGEOM	15	Created by
CREATED_BY	PLOTSNAP	33	Created by
CREATED_BY	POP_ESTN_UNIT	14	Created by
CREATED_BY	POP_EVAL	16	Created by
CREATED_BY	POP_EVAL_ATTRIBUTE	5	Created by
CREATED_BY	POP_EVAL_GRP	7	Created by
CREATED_BY	POP_EVAL_TYP	5	Created by
CREATED_BY	POP_PLOT_STRATUM_ ASSGN	13	Created by
CREATED_BY	POP_STRATUM	19	Created by
CREATED_BY	REF_CITATION	3	Created by

Column name with (field guide section)	Table name	Location in table	Description
CREATED_BY	REF_FIADB_VERSION	4	Created by
CREATED_BY	REF_FOREST_TYPE	7	Created by
CREATED_BY	REF_FOREST_TYPE_GROUP	17	Created by
CREATED_BY	REF_HABTYP_DESCRIPTION	7	Created by
CREATED_BY	REF_HABTYP_PUBLICATION	7	Created by
CREATED_BY	REF_INVASIVE_SPECIES	11	Created by
CREATED_BY	REF_PLANT_DICTIONARY	34	Created by
CREATED_BY	REF_POP_ATTRIBUTE	10	Created by
CREATED_BY	REF_POP_EVAL_TYP_DESCR	7	Created by
CREATED_BY	REF_SPECIES	73	Created by
CREATED_BY	REF_SPECIES_GROUP	5	Created by
CREATED_BY	REF_STATE_ELEV	6	Created by
CREATED_BY	REF_UNIT	4	Created by
CREATED_BY	SEEDLING	15	Created by
CREATED_BY	SITETREE	25	Created by
CREATED_BY	SUBPLOT	20	Created by
CREATED_BY	SUBP_COND	10	Created by
CREATED_BY	SUBP_COND_CHNG_MTRX	10	Created by
CREATED_BY	SURVEY	10	Created by
CREATED_BY	TREE	81	Created by
CREATED_BY	TREE_GRM_ESTN	44	Created by
CREATED_BY	TREE_REGIONAL_BIOMASS	5	Created by
CREATED_DATE	BOUNDARY	19	Created date
CREATED_DATE	COND	74	Created date
CREATED_DATE	COND_DWM_CALC	98	Created date
CREATED_DATE	COUNTY	7	Created date
CREATED_DATE	DWM_COARSE_WOODY_ DEBRIS	36	Created date
CREATED_DATE	DWM_DUFF_LITTER_FUEL	17	Created date
CREATED_DATE	DWM_FINE_WOODY DEBRIS	26	Created date
CREATED_DATE	DWM_MICROPLOT_FUEL	19	Created date
CREATED_DATE	DWM_RESIDUAL_PILE	27	Created date
CREATED_DATE	DWM_TRANSECT_SEGMENT	19	Created date
CREATED_DATE	DWM_VISIT	14	Created date
CREATED_DATE	INVASIVE_SUBPLOT_SPP	14	Created date
CREATED DATE	P2VEG_SUBP_STRUCTURE	14	Created date
CREATED_DATE	P2VEG_SUBPLOT_SPP	17	Created date
CREATED_DATE	PLOT	34	Created date
CREATED_DATE	PLOTGEOM	16	Created date
CREATED_DATE	PLOTSNAP	34	Created date
CREATED_DATE	POP_ESTN_UNIT	15	Created date
CREATED_DATE	POP_EVAL	17	Created date
CREATED_DATE	POP_EVAL_ATTRIBUTE	6	Created date
CREATED_DATE	POP_EVAL_GRP	8	Created date
CREATED_DATE	POP_EVAL_TYP	6	Created date
CREATED_DATE	POP_PLOT_STRATUM_ ASSGN	14	Created date
CREATED_DATE	POP_STRATUM	20	Created date
CREATED_DATE	REF_CITATION	4	Created date
CREATED_DATE	REF_FIADB_VERSION	5	Created date
CREATED_DATE	REF_FOREST_TYPE	8	Created date
CREATED_DATE	REF_FOREST_TYPE_GROUP	18	Created date

Column name with (field guide section)	Table name	Location in table	Description
CREATED_DATE	REF_HABTYP_DESCRIPTION	8	Created date
CREATED_DATE	REF_HABTYP_PUBLICATION	8	Created date
CREATED_DATE	REF_INVASIVE SPECIES	12	Created date
CREATED_DATE	REF_PLANT_DICTIONARY	34	Created date
CREATED_DATE	REF_POP_ATTRIBUTE	11	Created date
CREATED_DATE	REF_POP_EVAL_TYP_DESCR	8	Created date
CREATED_DATE	REF_SPECIES	74	Created date
CREATED_DATE	REF_SPECIES_GROUP	6	Created date
CREATED_DATE	REF_STATE_ELEV	7	Created date
CREATED_DATE	REF_UNIT	5	Created date
CREATED_DATE	SEEDLING	16	Created date
CREATED_DATE	SITETREE	26	Created date
CREATED_DATE	SUBPLOT	21	Created date
CREATED_DATE	SUBP_COND	11	Created date
CREATED_DATE	SUBP_COND_CHNG_MTRX	11	Created date
CREATED_DATE	SURVEY	11	Created date
CREATED_DATE	TREE	82	Created date
CREATED_DATE	TREE_GRM_ESTN	45	Created date
CREATED_DATE	TREE_REGIONAL_BIOMASS	6	Created date
CREATED_IN_INSTANCE	BOUNDARY	20	Created in instance
CREATED_IN_INSTANCE	COND	75	Created in instance
CREATED_IN_INSTANCE	COND_DWM_CALC	99	Created in instance
CREATED_IN_INSTANCE	COUNTY	8	Created in instance
CREATED_IN_INSTANCE	DWM_COARSE_WOODY_ DEBRIS	37	Created in instance
CREATED_IN_INSTANCE	DWM_DUFF_LITTER_FUEL	18	Created in instance
CREATED_IN_INSTANCE	DWM_FINE_WOODY DEBRIS	27	Created in instance
CREATED_IN_INSTANCE	DWM_MICROPLOT_FUEL	20	Created in instance
CREATED_IN_INSTANCE	DWM_RESIDUAL_PILE	28	Created in instance
CREATED_IN_INSTANCE	DWM_TRANSECT_SEGMENT	20	Created in instance
CREATED_IN_INSTANCE	DWM_VISIT	15	Created in instance
CREATED_IN_INSTANCE	INVASIVE_SUBPLOT_SPP	15	Created in instance
CREATED_IN_INSTANCE	P2VEG_SUBP_STRUCTURE	15	Created in instance
CREATED_IN_INSTANCE	P2VEG_SUBPLOT_SPP	18	Created in instance
CREATED_IN_INSTANCE	PLOT	35	Created in instance
CREATED_IN_INSTANCE	PLOTGEOM	17	Created in instance
CREATED_IN_INSTANCE	PLOTSNAP	35	Created in instance
CREATED_IN_INSTANCE	POP_ESTN_UNIT	16	Created in instance
CREATED_IN_INSTANCE	POP_EVAL	18	Created in instance
CREATED_IN_INSTANCE	POP_EVAL_ATTRIBUTE	7	Created in instance
CREATED_IN_INSTANCE	POP_EVAL_GRP	9	Created in instance
CREATED_IN_INSTANCE	POP_EVAL_TYP	7	Created in instance
CREATED_IN_INSTANCE	POP_PLOT_STRATUM_ ASSGN	15	Created in instance
CREATED_IN_INSTANCE	POP_STRATUM	21	Created in instance
CREATED_IN_INSTANCE	REF_CITATION	5	Created in instance
CREATED_IN_INSTANCE	REF_FIADB_VERSION	6	Created in instance
CREATED_IN_INSTANCE	REF_FOREST_TYPE	9	Created in instance
CREATED_IN_INSTANCE	REF_FOREST_TYPE_GROUP	19	Created in instance
CREATED_IN_INSTANCE	REF_HABTYP_DESCRIPTION	9	Created in instance
CREATED_IN_INSTANCE	REF_HABTYP_PUBLICATION	9	Created in instance
CREATED_IN_INSTANCE	REF_INVASIVE_SPECIES	13	Created in instance

Column name with (field guide section)	Table name	Location in table	Description
CREATED_IN_INSTANCE	REF_PLANT_DICTIONARY	36	Created in instance
CREATED_IN_INSTANCE	REF_POP_ATTRIBUTE	12	Created in instance
CREATED_IN_INSTANCE	REF_POP_EVAL_TYP_DESCR	9	Created in instance
CREATED_IN_INSTANCE	REF_SPECIES	75	Created in instance
CREATED_IN_INSTANCE	REF_SPECIES_GROUP	7	Created in instance
CREATED_IN_INSTANCE	REF_STATE_ELEV	8	Created in instance
CREATED_IN_INSTANCE	REF_UNIT	6	Created in instance
CREATED_IN_INSTANCE	SEEDLING	17	Created in instance
CREATED_IN_INSTANCE	SITETREE	27	Created in instance
CREATED_IN_INSTANCE	SUBPLOT	22	Created in instance
CREATED_IN_INSTANCE	SUBP_COND	12	Created in instance
CREATED_IN_INSTANCE	SUBP_COND_CHNG_MTRX	12	Created in instance
CREATED_IN_INSTANCE	SURVEY	12	Created in instance
CREATED_IN_INSTANCE	TREE	83	Created in instance
CREATED_IN_INSTANCE	TREE_GRM_ESTN	46	Created in instance
CREATED_IN_INSTANCE	TREE_REGIONAL_BIOMASS	7	Created in instance
CRWTYPCD	DWM_VISIT	11	Crew type code
CTY_CN	PLOT	3	County sequence number
CTY_CN	PLOTSNAP	3	County sequence number
CULL	TREE	28	Rotten and missing cull, computed and includes percent missing top
CULL_FLD (5.13)	TREE	91	Rotten and missing cull, field-recorded
CULLBF	TREE	71	Board-foot cull
CULLCF	TREE	72	Cubic-foot cull
CULLDEAD	TREE	68	Dead cull
CULLFORM	TREE	69	Form cull
CULLMSTOP	TREE	70	Missing top cull
CVIGORCD (12.8)	TREE	60	Sapling vigor code
CWD_CARBON_ADJ	COND_DWM_CALC	32	Coarse woody debris carbon mass per acre, adjusted
CWD_CARBON_COND	COND_DWM_CALC	30	Coarse woody debris carbon mass per acre in the condition
CWD_CARBON_UNADJ	COND_DWM_CALC	31	Coarse woody debris carbon mass per acre, unadjusted
CWD_DRYBIO_ADJ	COND_DWM_CALC	29	Coarse woody debris biomass per acre, adjusted
CWD_DRYBIO_COND	COND_DWM_CALC	27	Coarse woody debris biomass per acre in the condition
CWD_DRYBIO_UNADJ	COND_DWM_CALC	28	Coarse woody debris biomass per acre, unadjusted
CWD_LPA_ADJ	COND_DWM_CALC	23	Number of coarse woody debris logs (pieces) per acre, adjusted

Column name with (field guide section)	Table name	Location in table	Description
CWD_LPA_COND	COND_DWM_CALC	21	Number of coarse woody debris logs (pieces) per acre in the condition
CWD_LPA_UNADJ	COND_DWM_CALC	22	Number of coarse woody debris logs (pieces) per acre, unadjusted
CWD_TL_ADJ	COND_DWM_CALC	20	Coarse woody debris transect length, adjusted
CWD_TL_COND	COND_DWM_CALC	18	Coarse woody debris transect length in the condition
CWD_TL_UNADJ	COND_DWM_CALC	19	Coarse woody debris transect length, unadjusted
CWD_VOLCF_ADJ	COND_DWM_CALC	26	Coarse woody debris cubic foot volume per acre adjusted
CWD_VOLCF_COND	COND_DWM_CALC	24	Coarse woody debris cubic foot volume per acre in the condition
CWD_VOLCF_UNADJ	COND_DWM_CALC	25	Coarse woody debris cubic foot volume per acre, unadjusted
CWDID	DWM_COARSE_WOODY_ DEBRIS	9	Coarse woody debris piece number
CWDHSTCD	DWM_COARSE_WOODY_ DEBRIS	21	Coarse woody debris history code
CWD_DECAY_RATIO1	REF_SPECIES	62	Coarse woody debris decay ratio 1
CWD_DECAY_RATIO2	REF_SPECIES	63	Coarse woody debris decay ratio 2
CWD_DECAY_RATIO3	REF_SPECIES	64	Coarse woody debris decay ratio 3
CWD_DECAY_RATIO4	REF_SPECIES	65	Coarse woody debris decay ratio 4
CWD_DECAY_RATIO5	REF_SPECIES	66	Coarse woody debris decay ratio 5
CYCLE	BOUNDARY	16	Inventory cycle number
CYCLE	COND	79	Inventory cycle number
CYCLE	COND_DWM_CALC	103	Inventory cycle number
CYCLE	INVASIVE_SUBPLOT_SPP	19	Inventory cycle number
CYCLE	P2VEG_SUBP_STRUCTURE	19	Inventory cycle number
CYCLE	P2VEG_SUBPLOT_SPP	22	Inventory cycle number
CYCLE	PLOT	46	Inventory cycle number
CYCLE	PLOTSNAP	46	Inventory cycle number
CYCLE	SEEDLING	23	Inventory cycle number
CYCLE	SITETREE	31	Inventory cycle number
CYCLE	SUBPLOT	26	Inventory cycle number
CYCLE	SUBP_COND	21	Inventory cycle number
CYCLE	SURVEY	16	Inventory cycle number
CYCLE	TREE	123	Inventory cycle number
D	TREE_GRM_ESTN	38	Diversion
DAMLOC1 (5.20.1)	TREE	29	Damage location 1 code

Column name with (field guide section)	Table name	Location in table	Description
DAMLOC1_PNWRS	TREE	126	Damage location 1, Pacific Northwest Research Station
DAMLOC2 (5.20.4)	TREE	32	Damage location 2 code
DAMLOC2_PNWRS	TREE	127	Damage location 2, Pacific Northwest Research Station
DAMSEV1 (5.20.3)	TREE	31	Damage severity 1 code
DAMSEV2 (5.20.6)	TREE	34	Damage severity 2 code
DAMTYP1 (5.20.2)	TREE	30	Damage type 1 code
DAMTYP2 (5.20.5)	TREE	33	Damage type 2 code
DECAYCD	DWM_COARSE_WOODY_ DEBRIS	15	Decay class code
DECAYCD (5.23)	TREE	35	Decay class code
DECLINATION (1.14)	PLOT	40	Declination
DECLINATION	PLOTSNAP	40	Declination
DENSITY	DWM_RESIDUAL_PILE	13	Density (packing ratio of pile)
DESCR	REF_FIADB_VERSION	3	Version description
DESIGNCD	PLOT	17	Plot design code
DESIGNCD	PLOTSNAP	17	Design code
DESIGNCD_P2A	PLOT	57	Design code phase 2A
DHRBCD	DWM_MICROPLOT_FUEL	12	Dead herb code
DHRBHT	DWM_MICROPLOT_FUEL	17	Dead herb height
DIA (7.2.3)	SITETREE	12	Current diameter
DIA (5.9.2)	TREE	18	Current diameter
DIA_BEGIN	TREE_GRM_ESTN	24	Beginning diameter
DIA_BEGIN_RECALC	TREE_GRM_ESTN	25	Recalculated diameter
DIA_END	TREE_GRM_ESTN	26	Ending diameter
DIA_MIDPT	TREE_GRM_ESTN	27	Midpoint diameter
DIA_THRESHOLD	TREE_GRM_ESTN	28	Threshold diameter
DIACALC	TREE	65	Current diameter calculated
DIACHECK (5.12)	TREE	54	Diameter check code
DIACHECK_PNWRS	TREE	128	Diameter check, Pacific Northwest Research Station
DIAHTCD	TREE	19	Diameter height code
DIEBACK_SEVERITY_SRS	TREE	144	Dieback severity, Southern Research Station
DISEASE_SRS	TREE	143	Disease, Southern Research Station
DIST (7.2.9)	SITETREE	20	Horizontal distance
DIST (5.5)	TREE	13	Horizontal distance
DISTCORN (4.2.7)	BOUNDARY	14	Corner distance
DMG_AGENT1_CD_PNWRS	TREE	129	Damage agent 1, Pacific Northwest Research Station
DMG_AGENT2_CD_PNWRS	TREE	130	Damage agent 2, Pacific Northwest Research Station

Column name with (field guide section)	Table name	Location in table	Description
DMG_AGENT3_CD_PNWRS	TREE	131	Damage agent 3, Pacific Northwest Research Station
DRYBIO	DWM_COARSE_WOODY_ DEBRIS	23	Dry biomass of coarse woody debris piece
DRYBIO	DWM_RESIDUAL_PILE	21	Dry biomass
DRYBIO_BG	TREE	120	Dry biomass belowground
DRYBIO_BOLE	TREE	115	Dry biomass of bole
DRYBIO_SAPLING	TREE	118	Dry biomass of sapling
DRYBIO_STUMP	TREE	117	Dry biomass of stump
DRYBIO_TOP	TREE	116	Dry biomass of top
DRYBIO_WDLD_SPP	TREE	119	Dry biomass of woodland species
DSHRBCD	DWM_MICROPLOT_FUEL	10	Dead shrub code
DSHRBHT	DWM_MICROPLOT_FUEL	15	Dead shrub height
DSTRBCD1 (2.5.11)	COND	38	Disturbance 1 code
DSTRBCD2 (2.5.13)	COND	40	Disturbance 2 code
DSTRBCD3 (2.5.15)	COND	42	Disturbance 3 code
DSTRBYR1 (2.5.12)	COND	39	Year of disturbance 1
DSTRBYR2 (2.5.14)	COND	41	Year of disturbance 2
DSTRBYR3 (2.5.16)	COND	43	Year of disturbance 3
DUFF_BIOMASS	COND_DWM_CALC	88	Average duff biomass per acre in the condition
DUFF_CARBON	COND_DWM_CALC	89	Average duff carbon per acre in the condition
DUFF_CARBON_RATIO	REF_FOREST_TYPE_GROUP	5	Duff carbon ratio
DUFF_DENSITY	REF_FOREST_TYPE_GROUP	4	Duff density
DUFF_DEPTH	COND_DWM_CALC	87	Average duff depth in the condition
DUFF_TC_ADJ	COND_DWM_CALC	95	Number of duff, litter, and fuelbed sampling points on the entire plot, adjusted
DUFF_TC_COND	COND_DWM_CALC	93	Number of duff, litter, and fuelbed sampling points in the condition
DUFF_TC_UNADJ	COND_DWM_CALC	94	Number of duff, litter, and fuelbed sampling points on the entire plot, unadjusted
DUFFDEP	DWM_DUFF_LITTER_FUEL	13	Duff depth
DURATION	REF_PLANT_DICTIONARY	11	Duration
DWM_CARBON_RATIO	REF_SPECIES	67	Down woody debris carbon ratio
E_SPGRPCD	REF_SPECIES	8	East species group code
EAST	REF_SPECIES	28	East
ECO_UNIT_PNW	PLOT	48	Ecological unit used to identify Pacific Northwest Research Station stockability algorithms
ECO_UNIT_PNW	PLOTSNAP	48	Ecological unit, Pacific Northwest Research Station
ECOSUBCD	PLOT	27	Ecological subsection code

Column name with (field guide section)	Table name	Location in table	Description
ECOSUBCD	PLOTGEOM	10	Ecological subsection code
ECOSUBCD	PLOTSNAP	27	Ecological subsection code
END_DATE	REF_INVASIVE SPECIES	7	End date
ELEV	PLOT	22	Elevation
ELEV	PLOTSNAP	22	Elevation
EMAP_HEX	PLOT	41	EMAP hexagon
EMAP_HEX	PLOTGEOM	12	EMAP hexagon
EMAP_HEX	PLOTSNAP	41	EMAP hexagon
END_DATE	REF_INVASIVE_SPECIES	7	End date
END_INVYR	POP_EVAL	10	End inventory year
EST_BEGIN	TREE_GRM_ESTN	19	Beginning estimate
EST_BEGIN_RECALC	TREE_GRM_ESTN	20	Recalculated beginning estimate
EST_END	TREE_GRM_ESTN	21	Ending estimate
EST_MIDPT	TREE_GRM_ESTN	22	Midpoint estimation
EST_THRESHOLD	TREE_GRM_ESTN	23	Threshold estimate
ESTIMATE	TREE_GRM_ESTN	7	Base attribute that is being estimated
ESTN_METHOD	POP_EVAL	14	Estimation method
ESTN_TYPE	TREE_GRM_ESTN	8	Estimation type of the tree
ESTN_UNIT	POP_ESTN_UNIT	5	Estimation unit
ESTN_UNIT	POP_PLOT_STRATUM_ ASSGN	11	Estimation unit
ESTN_UNIT	POP_STRATUM	5	Estimation unit
ESTN_UNIT_CN	POP_STRATUM	2	Estimation unit sequence number
ESTN_UNIT_DESCR	POP_ESTN_UNIT	6	Estimation unit description
ESTN_UNITS	TREE_GRM_ESTN	9	Estimation units
EVAL_CN	POP_ESTN_UNIT	2	Evaluation sequence number
EVAL_CN	POP_EVAL_ATTRIBUTE	2	Evaluation sequence number
EVAL_CN	POP_EVAL_TYP	3	Evaluation sequence number
EVAL_DESCR	POP_EVAL	5	Evaluation description
EVAL_GRP	POP_EVAL_GRP	3	Reporting year followed by 4 more digits to make the statecd/eval_grp combo unique
EVAL_GRP	PLOTSNAP	51	Evaluation group
EVAL_GRP_CN	POP_EVAL	2	Evaluation group sequence number
EVAL_GRP_CN	POP_EVAL_TYP	2	Evaluation group sequence number
EVAL_GRP_CN	PLOTSNAP	50	Evaluation group sequence number
EVAL_GRP_DESCR	POP_EVAL_GRP	4	Evaluation group description
EVAL_TYP	POP_EVAL_TYP	4	Evaluation type
EVAL_TYP	REF_POP_ATTRIBUTE	5	Evaluation type
EVAL_TYP	REF_POP_EVAL_TYP_DESCR	3	Evaluation type
EVAL_TYP_DESCR	REF_POP_EVAL_TYP_DESCR	6	Evaluation type description

Column name with (field guide section)	Table name	Location in table	Description
EVAL_TYP_LABEL	REF_POP_EVAL_TYP_DESCR	4	Evaluation type label
EVALID	COND_DWM_CALC	8	Evaluation identification
EVALID	POP_ESTN_UNIT	4	Evaluation identifier
EVALID	POP_EVAL	4	Evaluation identifier
EVALID	POP_PLOT_STRATUM_ ASSGN	10	Evaluation identifier
EVALID	POP_STRATUM	4	Evaluation identifier
EXISTS_IN_NCRS	REF_SPECIES	15	Exists in the North Central Research Station States
EXISTS_IN_NERS	REF_SPECIES	16	Exists in the Northeastern Research Station States
EXISTS_IN_PNWRS	REF_SPECIES	17	Exists in the Pacific Northwest Research Station States
EXISTS_IN_RMRS	REF_SPECIES	18	Exists in the Rocky Mountain Research Station States
EXISTS_IN_SRS	REF_SPECIES	19	Exists in the Southern Research Station States
EXPALL	PLOTSNAP	52	Area expansion factor for all land
EXPCURR	PLOTSNAP	53	Area expansion factor for forest land and timberland
EXPGROW	PLOTSNAP	55	Growth expansion factor for forest land and timberland
EXPMORT	PLOTSNAP	56	Mortality expansion factor for forest land and timberland
EXPNS	POP_STRATUM	11	Expansion factor
EXPREMV	PLOTSNAP	57	Removals expansion factor for forest land and timberland
EXPRESSION	REF_POP_ATTRIBUTE	6	Part of the expression used to produce the estimate
EXPVOL	PLOTSNAP	54	Volume expansion factor for forest land and timberland
F	REF_PLANT_DICTIONARY	31	Forma indicator “f”
FAMILY	REF_PLANT_DICTIONARY	9	Family
FGROWBFSL	TREE	95	Net annual merchantable board-foot growth of sawtimber tree on forest land
FGROWCFAL	TREE	96	Net annual sound cubic-foot growth of a live tree on forest land
FGROWCFGS	TREE	94	Net annual merchantable cubic-foot growth of growing-stock tree on forest land
FIPSCOUNTY	PLOTGEOM	13	FIPS county code

Column name with (field guide section)	Table name	Location in table	Description
FIRE_SRS	COND	87	Fire, Southern Research Station
FLDAGE	COND	52	Field-recorded stand age
FLDSZCD (2.5.4)	COND	21	Field stand-size class code
FLDTYPCD (2.5.3)	COND	17	Field forest type code
FMORTBFSL	TREE	98	Board-foot volume of a sawtimber tree for mortality purposes on forest land
FMORTCFAL	TREE	99	Sound cubic-foot volume of a tree for mortality purposes on forest land
FMORTCFGS	TREE	97	Cubic-foot volume of a growing-stock tree for mortality purposes on forest land
FOOTNOTE	REF_POP_ATTRIBUTE	8	Footnote
FORMA	REF_PLANT_DICTIONARY	32	Forma
FOREST_TYPE_SPGRPCD	REF_SPECIES	14	Forest type species group code
FORINDCD (2.5.8)	COND	14	Private owner industrial status code
FORMCL	TREE	77	Form class
FORTYPCD	COND	16	Forest type code
FORTYPCDCALC	COND	55	Forest type code calculated with a national algorithm
FREMVBFSL	TREE	101	Board-foot volume of a sawtimber tree for removal purposes on forest land
FREMVCFAL	TREE	102	Sound cubic-foot volume of the tree for removal purposes on forest land
FREMVCFGS	TREE	100	Cubic-foot volume of a growing-stock tree for removal purposes on forest land
FUEL_BIOMASS	COND_DWM_CALC	85	Average fuelbed biomass per acre in the condition
FUEL_CARBON	COND_DWM_CALC	86	Average fuelbed carbon mass per acre in the condition
FUEL_DEPTH	COND_DWM_CALC	84	Average fuelbed depth in the condition
FUELDEP	DWM_DUFF_LITTER_FUEL	15	Fuelbed depth
FWD_CARBON_RATIO	REF_FOREST_TYPE_GROUP	12	Fine woody debris carbon ratio
FWD_DECAY_RATIO	REF_FOREST_TYPE_GROUP	13	Fine woody debris decay ratio
FWD_DENSITY	REF_FOREST_TYPE_GROUP	11	Fine woody debris density
FWD_LARGE_QMD	REF_FOREST_TYPE_GROUP	16	Large fine woody debris quadratic mean diameter

Column name with (field guide section)	Table name	Location in table	Description
FWD_LG_CARBON_ADJ	COND_DWM_CALC	71	Large-size class fine woody debris carbon mass per acre, adjusted
FWD_LG_CARBON_COND	COND_DWM_CALC	69	Large-size class fine woody debris carbon mass per acre in the condition
FWD_LG_CARBON_UNADJ	COND_DWM_CALC	70	Large-size class fine woody debris carbon mass per acre, unadjusted
FWD_LG_CNT_COND	COND_DWM_CALC	62	Large-size class fine woody debris pieces count in the condition
FWD_LG_DRYBIO_ADJ	COND_DWM_CALC	68	Large-size class fine woody debris biomass per acre, adjusted
FWD_LG_DRYBIO_COND	COND_DWM_CALC	66	Large-size class fine woody debris biomass per acre in the condition
FWD_LG_DRYBIO_UNADJ	COND_DWM_CALC	67	Large-size class fine woody debris biomass per acre, unadjusted
FWD_LG_TL_ADJ	COND_DWM_CALC	61	Large-size class fine woody debris transect length, adjusted
FWD_LG_TL_COND	COND_DWM_CALC	59	Large-size class fine woody debris transect length in the condition
FWD_LG_TL_UNADJ	COND_DWM_CALC	60	Large-size class fine woody debris transect length, unadjusted
FWD_LG_VOLCF_ADJ	COND_DWM_CALC	65	Large-size class fine woody debris cubic foot volume per acre, adjusted
FED_LG_VOLCF_COND	COND_DWM_CALC	63	Large-size class fine woody debris cubic foot volume per acre in the condition
FWD_LG_VOLCF_UNADJ	COND_DWM_CALC	64	Large-size class fine woody debris cubic foot volume per acre, unadjusted
FWD_MD_CARBON_ADJ	COND_DWM_CALC	58	Medium-size class fine woody debris carbon mass per acre, adjusted
FWD_MD_CARBON_COND	COND_DWM_CALC	56	Medium-size class fine woody debris carbon mass per acre in the condition
FWD_MD_CARBON_UNADJ	COND_DWM_CALC	57	Medium-size class fine woody debris carbon mass per acre, unadjusted
FWD_MD_CNT_COND	COND_DWM_CALC	49	Medium-size class fine woody debris pieces count in the condition

Column name with (field guide section)	Table name	Location in table	Description
FWD_MD_DRYBIO_ADJ	COND_DWM_CALC	55	Medium-size class fine woody debris biomass per acre
FWD_MD_DRYBIO_COND	COND_DWM_CALC	53	Medium-size class fine woody debris biomass per acre in the condition
FWD_MD_DRYBIO_UNADJ	COND_DWM_CALC	54	Medium-size class fine woody debris biomass per acre, unadjusted
FWD_MD_TL_ADJ	COND_DWM_CALC	48	Medium-size class fine woody debris transect length, adjusted
FWD_MD_TL_COND	COND_DWM_CALC	46	Medium-size class fine woody debris transect length in the condition
FWD_MD_TL_UNADJ	COND_DWM_CALC	47	Medium-size class fine woody debris transect length in all conditions, unadjusted
FWD_MD_VOLCF_ADJ	COND_DWM_CALC	52	Medium-size class fine woody debris cubic foot volume per acre, adjusted
FWD_MD_VOLCF_COND	COND_DWM_CALC	50	Medium-size fine woody debris cubic foot volume per acre in the condition
FWD_MD_VOLCF_UNADJ	COND_DWM_CALC	51	Medium-size class fine woody debris cubic foot volume per acre, unadjusted
FWD_MEDIUM_QMD	REF_FOREST_TYPE_GROUP	15	Medium fine woody debris quadratic mean diameter
FWD_SM_CNT_COND	COND_DWM_CALC	36	Small-size class fine woody debris pieces count in the condition
FWD_SM_CARBON_ADJ	COND_DWM_CALC	45	Small-size class fine woody debris carbon mass per acre, adjusted
FWD_SM_CARBON_COND	COND_DWM_CALC	43	Small-size class fine woody debris carbon mass per acre in the condition
FWD_SM_CARBON_UNADJ	COND_DWM_CALC	44	Small-size class fine woody debris carbon mass per acre, unadjusted
FWD_SM_DRYBIO_ADJ	COND_DWM_CALC	42	Small-size class fine woody debris biomass per acre, unadjusted
FWD_SM_DRYBIO_COND	COND_DWM_CALC	40	Small-size class fine woody debris biomass per acre in the condition
FWD_SM_DRYBIO_UNADJ	COND_DWM_CALC	41	Small-size class fine woody debris biomass per acre, unadjusted

Column name with (field guide section)	Table name	Location in table	Description
FWD_SM_TL_ADJ	COND_DWM_CALC	35	Small-size class fine woody debris transect length, adjusted
FWD_SM_TL_COND	COND_DWM_CALC	33	Small-size class fine woody debris transect length in the condition
FWD_SM_TL_UNADJ	COND_DWM_CALC	34	Small-size class fine woody debris transect length, unadjusted
FWD_SM_VOLCF_ADJ	COND_DWM_CALC	39	Small-size class fine woody debris cubic foot volume per acre, adjusted
FWD_SM_VOLCF_COND	COND_DWM_CALC	37	Small-size class fine woody debris cubic foot volume per acre in the condition
FWD_SM_VOLCF_UNADJ	COND_DWM_CALC	38	Small-size class fine woody debris cubic foot volume per acre, unadjusted
FWD_SMALL_QMD	REF_FOREST_TYPE_GROUP	14	Small fine woody debris quadratic mean diameter
G_C	TREE_GRM_ESTN	35	Cut growth
G_CD	TREE_GRM_ESTN	41	Cull decrement growth
G_CI	TREE_GRM_ESTN	43	Cull increment growth
G_D	TREE_GRM_ESTN	39	Diversion growth
G_I	TREE_GRM_ESTN	31	Growth on ingrowth
G_M	TREE_GRM_ESTN	33	Mortality growth
G_R	TREE_GRM_ESTN	37	Reversion growth
G_S	TREE_GRM_ESTN	29	Survivor growth
GENERA_BINOMIAL_AUTHOR	REF_PLANT_DICTIONARY	16	Genera binomial author
GENUS	REF_PLANT_DICTIONARY	20	Genus
GENUS	REF_SPECIES	3	Genus
GRAZING_SRS	COND	88	Grazing, Southern Research Station
GROUND_LAND_CLASS_PNW	COND	82	Present ground class code, Pacific Northwest Research Station
GROW_TYP_CD	PLOT	23	Type of annual volume growth code
GROW_TYP_CD	PLOTSNAP	23	Type of annual volume growth code
GROWBFSL	TREE	46	Net annual merchantable board-foot growth of sawtimber-size tree on timberland
GROWCFAL	TREE	47	Net annual sound cubic-foot growth of a live tree on timberland
GROWCFGS	TREE	45	Net annual merchantable cubic-foot growth of growing-stock tree on

Column name with (field guide section)	Table name	Location in table	Description
			timberland
GROWTH_ACCT	POP_EVAL	13	Growth accounting
GROWTH_HABIT	REF_PLANT_DICTIONARY	10	Growth habit
GROWTH_HABIT_CD	P2VEG_SUBP_STRUCTURE	10	Growth habit code
GROWTH_HABIT_CD (8.6.1)	P2VEG_SUBPLOT_SPP	13	Growth habit code
GSSTK	COND	54	Growing-stock stocking percent
GSSTKCD	COND	36	Growing-stock stocking code
HAPTYPCD	REF_HABTYP_DESCRIPTION	2	Habitat type code
HABTYPCD1	COND	56	Primary condition habitat type
HABTYPCD1_DESCR_PUB_CD	COND	58	Habitat type code 1 description publication code
HABTYPCD1_PUB_CD	COND	57	Habitat type code 1 publication code
HABTYPCD2	COND	59	Secondary condition habitat type
HABTYPCD2_DESCR_PUB_CD	COND	61	Habitat type code 2 description publication code
HABTYPCD2_PUB_CD	COND	60	Habitat type code 2 publication code
HARVEST_TYPE1_SRS	COND	89	Harvest type code 1, Southern Research Station
HARVEST_TYPE2_SRS	COND	90	Harvest type code 2, Southern Research Station
HARVEST_TYPE3_SRS	COND	91	Harvest type code 3, Southern Research Station
HEIGHT1	DWM_RESIDUAL_PILE	14	Height first measurement
HEIGHT2	DWM_RESIDUAL_PILE	17	Height second measurement
HIGHEST_POINT	REF_STATE_ELEV	5	Highest point
HOLLOWCD	DWM_COARSE_WOODY_ DEBRIS	20	Hollow code
HORIZ_BEGNDIST	DWM_TRANSECT_SEGMENT	16	Beginning horizontal distance of a coarse woody debris transect segment
HORIZ_DIST	DWM_COARSE_WOODY_ DEBRIS	13	Horizontal distance
HORIZ_ENDDIST	DWM_TRANSECT_SEGMENT	17	Ending horizontal distance of a coarse woody debris transect segment
HORIZ_LENGTH	DWM_TRANSECT_SEGMENT	15	Horizontal length
HRDWD_CLUMP_CD	TREE	79	Hardwood clump code
HT (7.24)	SITETREE	13	Total height
HT (5.14)	TREE	20	Total height
HTCALC	TREE	78	Current height calculated
HTCD (5.16)	TREE	21	Height method code

Column name with (field guide section)	Table name	Location in table	Description
HTDMP (5.24)	TREE	88	Length (height) to diameter measurement point
HUC	PLOTGEOM	11	Hydrologic unit code
I	TREE_GRM_ESTN	30	Ingrowth
INDUSTRIALCD_FIADB	COND	102	Industrial code
INSTALL_TYPE	REF_FIADB_VERSION	2	Install type
INTENSITY	PLOT	45	Intensity
INTENSITY	PLOTSNAP	45	Intensity
INV_GROUP_CD	REF_INVASIVE_SPECIES	4	Invasive group code
INVASIVE_NONSAMPLE_ REASON_CD	SUBPLOT	34	Invasive nonsampled reason code
INVASIVE_SAMPLING_STATUS _CD	PLOT	55	Invasive sampling status code
INVASIVE_SPECIMEN_RULE_ CD	PLOT	56	Invasive specimen rule code
INVASIVE_SUBP_STATUS_CD	SUBPLOT	33	Invasive subplot status code
INVYR	BOUNDARY	3	Inventory year
INVYR	COND	3	Inventory year
INVYR	COND_DWM_CALC	6	Inventory year
INVYR	DWM_COARSE_WOODY_ DEBRIS	3	Inventory year
INVYR	DWM_DUFF_LITTER_FUEL	3	Inventory year
INVYR	DWM_FINE_WOODY DEBRIS	3	Inventory year
INVYR	DWM_MICROPLOT_FUEL	3	Inventory year
INVYR	DWM_RESIDUAL_PILE	3	Inventory year
INVYR	DWM_TRANSECT_SEGMENT	3	Inventory year
INVYR	DWM_VISIT	3	Inventory year
INVYR	INVASIVE_SUBPLOT_SPP	3	Inventory year
INVYR	P2VEG_SUBP_STRUCTURE	7	Inventory year
INVYR	P2VEG_SUBPLOT_SPP	3	Inventory year
INVYR	PLOT	5	Inventory year
INVYR	PLOTGEOM	3	Inventory year
INVYR	PLOTSNAP	5	Inventory year
INVYR	POP_PLOT_STRATUM_ ASSGN	5	Inventory year
INVYR	SEEDLING	3	Inventory year
INVYR	SITETREE	4	Inventory year
INVYR	SUBPLOT	4	Inventory year
INVYR	SUBP_COND	3	Inventory year
INVYR	SURVEY	2	Inventory year
INVYR	TREE	4	Inventory year
INVYR	TREE_GRM_ESTN	3	Inventory year
JENKINS_FOLIAGE_RATIO_B1	REF_SPECIES	42	Jenkins foliage ratio B1
JENKINS_FOLIAGE_RATIO_B2	REF_SPECIES	43	Jenkins foliage ratio B2
JENKINS_ROOT_RATIO_B1	REF_SPECIES	44	Jenkins root ratio B1
JENKINS_ROOT_RATIO_B2	REF_SPECIES	45	Jenkins root ratio B2
JENKINS_SAPLING_ ADJUSTMENT	REF_SPECIES	46	Jenkins sapling adjustment factor
JENKINS_SPGRPCD	REF_SPECIES	35	Jenkins species group code
JENKINS_STEM_BARK_RATIO_ B1	REF_SPECIES	40	Jenkins stem bark ratio B1

Column name with (field guide section)	Table name	Location in table	Description
JENKINS_STEM_BARK_RATIO_B2	REF_SPECIES	41	Jenkins stem bark ratio B2
JENKINS_STEM_WOOD_RATIO_B1	REF_SPECIES	38	Jenkins stem wood ratio B1
JENKINS_STEM_WOOD_RATIO_B2	REF_SPECIES	39	Jenkins stem wood ratio B2
JENKINS_TOTAL_B1	REF_SPECIES	36	Jenkins coefficient B1
JENKINS_TOTAL_B2	REF_SPECIES	37	Jenkins coefficient B2
KINDCD (1.10)	PLOT	16	Sample kind code
KINDCD	PLOTSNAP	16	Sample kind code
KINDCD_NC	PLOT	31	Sample kind code, North Central
KINDCD_NC	PLOTSNAP	31	Sample kind code, North Central
LABEL_ORDER	REF_POP_EVAL_TYP_DESCR	2	Label order
LAND_BASIS	TREE_GRM_ESTN	6	Land basis for estimate
LAND_COVER_CLASS_CD (2.5.29)	COND	106	Land cover class
LAND_ONLY	POP_EVAL	11	Land only
LAND_USE_SRS	COND	92	Land use, Southern Research Station
LARGE_TL_COND	DWM_FINE_WOODY DEBRIS	22	Large-size class transect length in condition
LARGE_TL_PLOT	DWM_FINE_WOODY DEBRIS	23	Large-size class transect length on plot
LARGE_TL_UNADJ	DWM_FINE_WOODY DEBRIS	24	Large-size class transect length on plot, unadjusted
LARGECT	DWM_FINE_WOODY DEBRIS	13	Large-size class count
LARGEDIA	DWM_COARSE_WOODY_DEBRIS	18	Large diameter
LAT (1.19.8)	PLOT	20	Latitude
LAT	PLOTGEOM	7	Latitude
LAT	PLOTSNAP	20	Latitude
LAYER	P2VEG_SUBP_STRUCTURE	11	Layer
LAYER (8.6.5)	P2VEG_SUBPLOT_SPP	14	Layer
LENGTH	DWM_COARSE_WOODY_DEBRIS	19	Length
LENGTH1	DWM_RESIDUAL_PILE	16	Length first measurement
LENGTH2	DWM_RESIDUAL_PILE	19	Length second measurement
LITTDEP	DWM_DUFF_LITTER_FUEL	14	Litter depth
LITTER_BIOMASS	COND_DWM_CALC	91	Average litter biomass per acre in the condition
LITTER_CARBON	COND_DWM_CALC	92	Average litter carbon per acre in the condition
LITTER_CARBON_RATIO	REF_FOREST_TYPE_GROUP	7	Litter carbon ratio
LITTER_DENSITY	REF_FOREST_TYPE_GROUP	6	Litter density
LITTER_DEPTH	COND_DWM_CALC	90	Average litter depth in the condition
LITTERCD	DWM_MICROPLOT_FUEL	13	Litter code
LIVE_CANOPY_CVR_PCT	COND	98	Live canopy cover percent

Column name with (field guide section)	Table name	Location in table	Description
LIVE_MISSING_CANOPY_CVR_PCT	COND	99	Live plus missing canopy cover percent
LOCATION_NM	POP_EVAL	7	Usually State name or super State
LON (1.19.9)	PLOT	21	Longitude
LON	PLOTGEOM	8	Longitude
LON	PLOTSNAP	21	Longitude
LOWEST_POINT	REF_STATE_ELEV	4	Lowest point
LPA_COND	DWM_COARSE_WOODY_DEBRIS	28	Number of logs (pieces) per acre in the condition, national core design
LPA_COND_RGN	DWM_COARSE_WOODY_DEBRIS	31	Number of logs (pieces) per acre in the condition, regional design
LPA_PLOT	DWM_COARSE_WOODY_DEBRIS	27	Number of logs (pieces) per acre on the plot, national core design
LPA_PLOT_RGN	DWM_COARSE_WOODY_DEBRIS	30	Number of logs (pieces) per acre on the plot, regional design
LPA_UNADJ	DWM_COARSE_WOODY_DEBRIS	26	Number of logs (piece) per acre, unadjusted, national core design
LPA_UNADJ_RGN	DWM_COARSE_WOODY_DEBRIS	29	Number of logs (pieces) per acre, unadjusted, regional design
LVHRBCD	DWM_MICROPLOT_FUEL	11	Live herb code
LVHRBHT	DWM_MICROPLOT_FUEL	16	Live herb height
LVSHRBCD	DWM_MICROPLOT_FUEL	9	Live shrub code
LVSHRBHT	DWM_MICROPLOT_FUEL	14	Live shrub height
M	TREE_GRM_ESTN	32	Mortality
MACRCOND	SUBPLOT	14	Macroplot center condition
MACRCOND_PROP	SUBP_COND	18	Proportion of this macroplot in this condition
MACRO_BREAKPOINT_DIA (1.20)	PLOT	44	Macroplot breakpoint diameter
MACRO_BREAKPOINT_DIA	PLOTSNAP	44	Macroplot breakpoint diameter
MACRPROP_UNADJ	COND	32	Macroplot proportion unadjusted
MAJOR_SPGRPCD	REF_SPECIES	12	Major species group code
MANUAL (1.12)	PLOT	29	Manual (field guide) version number
MANUAL	PLOTSNAP	29	Manual (field guide) version number
MANUAL_END	REF_FOREST_TYPE	5	Manual end
MANUAL_END	REF_INVASIVE_SPECIES	9	Manual end
MANUAL_END	REF_SPECIES	34	Manual end
MANUAL_START	REF_FOREST_TYPE	4	Manual start
MANUAL_START	REF_INVASIVE_SPECIES	8	Manual start
MANUAL_START	REF_SPECIES	33	Manual start
MAPDEN	COND	18	Mapping density

Column name with (field guide section)	Table name	Location in table	Description
MAX_ELEV	REF_STATE_ELEV	3	Maximum elevation
MC_PCT_GREEN BARK	REF_SPECIES	51	Moisture content of green bark as a percent of oven-dry weight
MC_PCT_GREEN_BARK_CIT	REF_SPECIES	52	Moisture content of green bark citation
MC_PCT_GREEN_WOOD	REF_SPECIES	53	Moisture content of green wood as a percent of oven-dry weight
MC_PCT_GREEN_WOOD_CIT	REF_SPECIES	54	Moisture content of green wood citation
MEANING	REF_FOREST_TYPE	2	Meaning
MEANING	REF_FOREST_TYPE_GROUP	2	Meaning
MEANING	REF_UNIT	3	Meaning
MEASDAY	DWM_VISIT	7	Measurement day
MEASDAY (1.13.3)	PLOT	14	Measurement day
MEASDAY	PLOTSNAP	14	Measurement day
MEASMON	DWM_VISIT	8	Measurement month
MEASMON (1.13.2)	PLOT	13	Measurement month
MEASMON	PLOTSNAP	13	Measurement month
MEASYEAR	COND_DWM_CALC	5	Measurement year
MEASYEAR	DWM_COARSE_WOODY_ DEBRIS	10	Measurement year
MEASYEAR	DWM_DUFF_LITTER_FUEL	10	Measurement year
MEASYEAR	DWM_FINE_WOODY DEBRIS	10	Measurement year
MEASYEAR	DWM_MICROPLOT_FUEL	8	Measurement year
MEASYEAR	DWM_RESIDUAL_PILE	9	Measurement year
MEASYEAR	DWM_TRANSECT_SEGMENT	10	Measurement year
MEASYEAR	DWM_VISIT	9	Measurement year
MEASYEAR (1.13.1)	PLOT	12	Measurement year
MEASYEAR	PLOTSNAP	12	Measurement year
MEDIUM_TL_COND	DWM_FINE_WOODY DEBRIS	19	Medium-size class transect length in condition
MEDIUM_TL_PLOT	DWM_FINE_WOODY DEBRIS	20	Medium-size class transect length on plot
MEDIUM_TL_UNADJ	DWM_FINE_WOODY DEBRIS	21	Medium-size class transect length on plot, unadjusted
MEDIUMCT	DWM_FINE_WOODY DEBRIS	12	Medium-size class count
METHOD	SITETREE	21	Site tree method code
MICRCOND (3.7)	SUBPLOT	12	Microplot center condition
MICRCOND_PROP	SUBP_COND	16	Proportion of this microplot in this condition
MICROPLOT_LOC	PLOT	39	Microplot location
MICROPLOT_LOC	PLOTSNAP	39	Microplot location
MICRPROP_UNADJ	COND	30	Microplot proportion unadjusted
MIN_ELEV	REF_STATE_ELEV	2	Minimum elevation
MIST_CL_CD (5.26)	TREE	90	Mistletoe class code
MIST_CL_CD_PNWRS	TREE	132	Leafy mistletoe class code, Pacific Northwest Research Station

Column name with (field guide section)	Table name	Location in table	Description
MIXEDCONFCD	COND	62	Calculated forest type for mixed conifer site
MODIFIED_BY	BOUNDARY	21	Modified by
MODIFIED_BY	COND	76	Modified by
MODIFIED_BY	COND_DWM_CALC	100	Modified by
MODIFIED_BY	COUNTY	9	Modified by
MODIFIED_BY	DWM_COARSE_WOODY_ DEBRIS	38	Modified by
MODIFIED_BY	DWM_DUFF_LITTER_FUEL	19	Modified by
MODIFIED_BY	DWM_FINE_WOODY DEBRIS	28	Modified by
MODIFIED_BY	DWM_MICROPLOT_FUEL	21	Modified by
MODIFIED_BY	DWM_RESIDUAL_PILE	29	Modified by
MODIFIED_BY	DWM_TRANSECT_SEGMENT	21	Modified by
MODIFIED_BY	DWM_VISIT	16	Modified by
MODIFIED_BY	INVASIVE_SUBPLOT_SPP	16	Modified by
MODIFIED_BY	P2VEG_SUBP_STRUCTURE	16	Modified by
MODIFIED_BY	P2VEG_SUBPLOT_SPP	19	Modified by
MODIFIED_BY	PLOT	36	Modified by
MODIFIED_BY	PLOTGEOM	18	Modified by
MODIFIED_BY	PLOTSNAP	36	Modified by
MODIFIED_BY	POP_ESTN_UNIT	17	Modified by
MODIFIED_BY	POP_EVAL	19	Modified by
MODIFIED_BY	POP_EVAL_ATTRIBUTE	8	Modified by
MODIFIED_BY	POP_EVAL_GRP	10	Modified by
MODIFIED_BY	POP_EVAL_TYP	8	Modified by
MODIFIED_BY	POP_PLOT_STRATUM_ASSGN	16	Modified by
MODIFIED_BY	POP_STRATUM	22	Modified by
MODIFIED_BY	REF_CITATION	6	Modified by
MODIFIED_BY	REF_FIADB_VERSION	7	Modified by
MODIFIED_BY	REF_FOREST_TYPE	10	Modified by
MODIFIED_BY	REF_FOREST_TYPE_GROUP	20	Modified by
MODIFIED_BY	REF_HABTYP_DESCRIPTION	10	Modified by
MODIFIED_BY	REF_HABTYP_PUBLICATION	10	Modified by
MODIFIED_BY	REF_INVASIVE_SPECIES	14	Modified by
MODIFIED_BY	REF_PLANT_DICTIONARY	37	Modified by
MODIFIED_BY	REF_POP_ATTRIBUTE	13	Modified by
MODIFIED_BY	REF_POP_EVAL_TYP_DESCR	10	Modified by
MODIFIED_BY	REF_SPECIES	76	Modified by
MODIFIED_BY	REF_SPECIES_GROUP	8	Modified by
MODIFIED_BY	REF_STATE_ELEV	9	Modified by
MODIFIED_BY	REF_UNIT	7	Modified by
MODIFIED_BY	SEEDLING	18	Modified by
MODIFIED_BY	SITETREE	28	Modified by
MODIFIED_BY	SUBPLOT	23	Modified by
MODIFIED_BY	SUBP_COND	13	Modified by
MODIFIED_BY	SUBP_COND_CHNG_MTRX	13	Modified by
MODIFIED_BY	SURVEY	13	Modified by
MODIFIED_BY	TREE	84	Modified by
MODIFIED_BY	TREE_GRM_ESTN	47	Modified by
MODIFIED_BY	TREE_REGIONAL_BIOMASS	8	Modified by
MODIFIED_DATE	BOUNDARY	22	Modified date

Column name with (field guide section)	Table name	Location in table	Description
MODIFIED_DATE	COND	77	Modified date
MODIFIED_DATE	COND_DWM_CALC	101	Modified date
MODIFIED_DATE	COUNTY	10	Modified date
MODIFIED_DATE	DWM_COARSE_WOODY_ DEBRIS	39	Modified date
MODIFIED_DATE	DWM_DUFF_LITTER_FUEL	20	Modified date
MODIFIED_DATE	DWM_FINE_WOODY DEBRIS	29	Modified date
MODIFIED_DATE	DWM_MICROPLOT_FUEL	22	Modified date
MODIFIED_DATE	DWM_RESIDUAL_PILE	31	Modified date
MODIFIED_DATE	DWM_TRANSECT_SEGMENT	23	Modified date
MODIFIED_DATE	DWM_VISIT	17	Modified date
MODIFIED_DATE	INVASIVE_SUBPLOT_SPP	17	Modified date
MODIFIED_DATE	P2VEG_SUBP_STRUCTURE	17	Modified date
MODIFIED_DATE	P2VEG_SUBPLOT_SPP	20	Modified date
MODIFIED_DATE	PLOT	37	Modified date
MODIFIED_DATE	PLOTGEOM	19	Modified date
MODIFIED_DATE	PLOTSNAP	37	Modified date
MODIFIED_DATE	POP_ESTN_UNIT	18	Modified date
MODIFIED_DATE	POP_EVAL	20	Modified date
MODIFIED_DATE	POP_EVAL_ATTRIBUTE	9	Modified date
MODIFIED_DATE	POP_EVAL_GRP	11	Modified date
MODIFIED_DATE	POP_EVAL_TYP	9	Modified date
MODIFIED_DATE	POP_PLOT_STRATUM_ASSGN	17	Modified date
MODIFIED_DATE	POP_STRATUM	23	Modified date
MODIFIED_DATE	REF_CITATION	7	Modified date
MODIFIED_DATE	REF_FIADB_VERSION	8	Modified date
MODIFIED_DATE	REF_FOREST_TYPE	11	Modified date
MODIFIED_DATE	REF_FOREST_TYPE_GROUP	21	Modified date
MODIFIED_DATE	REF_HABTYP_DESCRIPTION	11	Modified date
MODIFIED_DATE	REF_HABTYP_PUBLICATION	11	Modified date
MODIFIED_DATE	REF_INVASIVE_SPECIES	15	Modified date
MODIFIED_DATE	REF_PLANT_DICTIONARY	38	Modified date
MODIFIED_DATE	REF_POP_ATTRIBUTE	14	Modified date
MODIFIED_DATE	REF_POP_EVAL_TYP_DESCR	11	Modified date
MODIFIED_DATE	REF_SPECIES	77	Modified date
MODIFIED_DATE	REF_SPECIES_GROUP	9	Modified date
MODIFIED_DATE	REF_STATE_ELEV	10	Modified date
MODIFIED_DATE	REF_UNIT	8	Modified date
MODIFIED_DATE	SEEDLING	19	Modified date
MODIFIED_DATE	SITETREE	29	Modified date
MODIFIED_DATE	SUBPLOT	24	Modified date
MODIFIED_DATE	SUBP_COND	14	Modified date
MODIFIED_DATE	SUBP_COND_CHNG_MTRX	14	Modified date
MODIFIED_DATE	SURVEY	14	Modified date
MODIFIED_DATE	TREE	85	Modified date
MODIFIED_DATE	TREE_GRM_ESTN	48	Modified date
MODIFIED_DATE	TREE_REGIONAL_BIOMASS	9	Modified date
MODIFIED_IN_INSTANCE	BOUNDARY	23	Modified in instance
MODIFIED_IN_INSTANCE	COND	78	Modified in instance
MODIFIED_IN_INSTANCE	COND_DWM_CALC	102	Modified in instance
MODIFIED_IN_INSTANCE	COUNTY	11	Modified in instance

Column name with (field guide section)	Table name	Location in table	Description
MODIFIED_IN_INSTANCE	DWM_COARSE_WOODY_ DEBRIS	40	Modified in instance
MODIFIED_IN_INSTANCE	DWM_DUFF_LITTER_FUEL	21	Modified in instance
MODIFIED_IN_INSTANCE	DWM_FINE_WOODY DEBRIS	30	Modified in instance
MODIFIED_IN_INSTANCE	DWM_MICROPLOT_FUEL	23	Modified in instance
MODIFIED_IN INSTANCE	DWM_RESIDUAL_PILE	30	Modified in instance
MODIFIED_IN_INSTANCE	DWM_TRANSECT_SEGMENT	22	Modified in instance
MODIFIED_IN_INSTANCE	DWM_VISIT	18	Modified in instance
MODIFIED_IN_INSTANCE	INVASIVE_SUBPLOT_SPP	18	Modified in instance
MODIFIED_IN_INSTANCE	P2VEG_SUBP_STRUCTURE	18	Modified in instance
MODIFIED_IN_INSTANCE	P2VEG_SUBPLOT_SPP	21	Modified in instance
MODIFIED_IN_INSTANCE	PLOT	38	Modified in instance
MODIFIED_IN_INSTANCE	PLOTGEOM	20	Modified in instance
MODIFIED_IN_INSTANCE	PLOTSNAP	38	Modified in instance
MODIFIED_IN_INSTANCE	POP_ESTN_UNIT	19	Modified in instance
MODIFIED_IN_INSTANCE	POP_EVAL	21	Modified in instance
MODIFIED_IN_INSTANCE	POP_EVAL_ATTRIBUTE	10	Modified in instance
MODIFIED_IN_INSTANCE	POP_EVAL_GRP	12	Modified in instance
MODIFIED_IN_INSTANCE	POP_EVAL_TYP	10	Modified in instance
MODIFIED_IN_INSTANCE	POP_PLOT_STRATUM_ASSGN	18	Modified in instance
MODIFIED_IN_INSTANCE	POP_STRATUM	24	Modified in instance
MODIFIED_IN_INSTANCE	REF_CITATION	8	Modified in instance
MODIFIED_IN_INSTANCE	REF_FIADB_VERSION	9	Modified in instance
MODIFIED_IN_INSTANCE	REF_FOREST_TYPE	12	Modified in instance
MODIFIED_IN_INSTANCE	REF_FOREST_TYPE_GROUP	22	Modified in instance
MODIFIED_IN_INSTANCE	REF_HABTYP_DESCRIPTION	12	Modified in instance
MODIFIED_IN_INSTANCE	REF_HABTYP_PUBLICATION	12	Modified in instance
MODIFIED_IN_INSTANCE	REF_INVASIVE_SPECIES	16	Modified in instance
MODIFIED_IN_INSTANCE	REF_PLANT_DICTIONARY	39	Modified n instance
MODIFIED_IN_INSTANCE	REF_POP_ATTRIBUTE	15	Modified in instance
MODIFIED_IN_INSTANCE	REF_POP_EVAL_TYP_DESCR	12	Modified in instance
MODIFIED_IN_INSTANCE	REF_SPECIES	78	Modified in instance
MODIFIED_IN_INSTANCE	REF_SPECIES_GROUP	10	Modified in instance
MODIFIED_IN_INSTANCE	REF_STATE_ELEV	11	Modified in instance
MODIFIED_IN_INSTANCE	REF_UNIT	9	Modified in instance
MODIFIED_IN_INSTANCE	SEEDLING	20	Modified in instance
MODIFIED_IN_INSTANCE	SITETREE	30	Modified in instance
MODIFIED_IN_INSTANCE	SUBPLOT	25	Modified in instance
MODIFIED_IN_INSTANCE	SUBP_COND	15	Modified in instance
MODIFIED_IN_INSTANCE	SUBP_COND_CHNG_MTRX	15	Modified in instance
MODIFIED_IN_INSTANCE	SURVEY	15	Modified in instance
MODIFIED_IN_INSTANCE	TREE	86	Modified in instance
MODIFIED_IN_INSTANCE	TREE_GRM_ESTN	49	Modified in instance
MODIFIED_IN_INSTANCE	TREE_REGIONAL_BIOMASS	10	Modified in instance
MORT_TYP_CD	PLOT	24	Type of annual mortality volume code
MORT_TYP_CD	PLOTSNAP	24	Type of annual mortality volume code
MORTALITY	TREE_GRM_ESTN	18	Mortality estimate

Column name with (field guide section)	Table name	Location in table	Description
MORTBFSL	TREE	49	Board-foot volume of a sawtimber-size tree on timberland for mortality purposes
MORTCD (5.7.3)	TREE	87	Mortality code
MORTCFAL	TREE	50	Sound cubic-foot volume of a tree on timberland for mortality purposes
MORTCFGS	TREE	48	Cubic-foot volume of a growing-stock tree on timberland for mortality purposes
MORTYR (5.22)	TREE	55	Mortality year
NAME	REF_SPECIES_GROUP	2	Name
NBR_LIVE_STEMS	COND	100	Number of live stems
NEW_SCIENTIFIC_NAME	REF_PLANT_DICTIONARY	6	New scientific name
NEW_SYMBOL	REF_PLANT_DICTIONARY	5	New symbol
NF_COND_NONSAMPLE_ REASN_CD	COND	96	Nonforest condition nonsampled reason code
NF_COND_STATUS_CD	COND	95	Nonforest condition status code
NF_PLOT_NONSAMPLE_REASN _CD	PLOT	52	Nonforest plot nonsampled reason code
NF_PLOT_STATUS_CD	PLOT	51	Nonforest plot status code
NF_SAMPLING_STATUS_CD	PLOT	50	Nonforest sampling status code
NF_SUBP_NONSAMPLE_REASN _CD	SUBPLOT	30	Nonforest subplot nonsampled reason code
NF_SUBP_STATUS_CD	SUBPLOT	29	Nonforest subplot status code
NONFR_INCL_PCT_MACRO	SUBP_COND	20	Nonforest inclusions percentage of macroplot
NONFR_INCL_PCT_SUBP	SUBP_COND	19	Nonforest inclusions percentage of subplot
NOTES	POP_EVAL	15	Evaluation notes
NOTES	POP_EVAL_GRP	6	Notes
NOTES	REF_INVASIVE_SPECIES	10	Notes
NOTES	REF_PLANT_DICTIONARY	33	Notes
NOTES	SURVEY	9	Notes (about the inventory)
ONEORTWO	BEGINEND	1	One or two
OPERABILITY_SRS	COND	93	Operability in Southern Research Station
ORNTCD_PNWRS	DWM_COARSE_WOODY_ DEBRIS	34	Orientation code, Pacific Northwest Research Station
OWNCD (2.5.8)	COND	12	Owner class code
OWNGRPCD (2.5.2)	COND	13	Owner group code
OWNSUBCD	COND	101	Owner subclass code
P_SPGRPCD	REF_SPECIES	11	Pacific species group code

Column name with (field guide section)	Table name	Location in table	Description
P1PNTCNT_EU	POP_ESTN_UNIT	12	Phase 1 point count (total number of pixels) in the estimation unit
P1POINTCNT	POP_STRATUM	9	Phase 1 point count
P1SOURCE	POP_ESTN_UNIT	13	Phase 1 source
P2A_GRM_FLG	SUBPLOT	19	Periodic to annual growth, removal, and mortality flag
P2A_GRM_FLG	TREE	103	Periodic to annual growth, removal, and mortality flag
P2PANEL	PLOT	25	Phase 2 panel number
P2PANEL	PLOTSNAP	25	Phase 2 panel number
P2POINTCNT	POP_STRATUM	10	Phase 2 point count
P2VEG_SAMPLING_LEVEL_ DETAIL_CD	PLOT	54	P2 vegetation sampling level detail code
P2VEG_SAMPLING_STATUS_ CD	PLOT	53	P2 vegetation sampling status code
P2VEG_SUBP_NONSAMPLE_ REASN_CD	SUBPLOT	32	P2 vegetation nonsampled reason code
P2VEG_SUBP_STATUS_CD	SUBPLOT	31	P2 vegetation subplot status code
P3_OZONE_IND	SURVEY	3	Phase 3 ozone indicator plot
P3PANEL	PLOT	26	Phase 3 panel number
P3PANEL	PLOTSNAP	26	Phase 3 panel number
PACIFIC	REF_SPECIES	31	Pacific species
PHASE	COND_DWM_CALC	12	Phase
PHYSCLCD (2.5.23)	COND	35	Physiographic class code
PILE	DWM_RESIDUAL_PILE	8	Pile number
PILE_CARBON_ADJ	COND_DWM_CALC	83	Carbon mass per acre of piles, for population estimates, adjusted
PILE_CARBON_COND	COND_DWM_CALC	81	Carbon mass per acre of piles in the condition, for condition estimates
PILE_CARBON_RATIO	REF_FOREST_TYPE_GROUP	9	Pile carbon ratio
PILE_CARBON_UNADJ	COND_DWM_CALC	82	Carbon mass per acre of piles, for population estimates, unadjusted
PILE_DECAY_RATIO	REF_FOREST_TYPE_GROUP	10	Pile decay ratio
PILE_DENSITY	REF_FOREST_TYPE_GROUP	8	Pile density
PILE_DRYBIO_ADJ	COND_DWM_CALC	80	Biomass per acre of piles, for population estimates, adjusted
PILE_DRYBIO_COND	COND_DWM_CALC	78	Biomass per acre of piles in the condition, for condition estimates
PILE_DRYBIO_UNADJ	COND_DWM_CALC	79	Biomass per acre of piles, for population estimates, unadjusted
PILE_SAMPLE_AREA_ADJ	COND_DWM_CALC	74	Plot area sampled for piles, in all conditions, adjusted

Column name with (field guide section)	Table name	Location in table	Description
PILE_SAMPLE_AREA_COND	COND_DWM_CALC	72	Condition area sampled for piles
PILE_SAMPLE_AREA_UNAJ	COND_DWM_CALC	73	Plot area sampled for piles, in all conditions, unadjusted
PILE_VOLCF_ADJ	COND_DWM_CALC	77	Cubic foot volume per acre of piles, for population estimates, adjusted
PILE_VOLCG_COND	COND_DWM_CALC	75	Cubic foot volume per acre of piles in the condition
PILE_VOLCF_UNADJ	COND_DWM_CALC	76	Cubic foot volume per acre of piles, for population estimates, unadjusted
PILESCD	DWM_FINE_WOODY DEBRIS	15	Piles code
PLANT_STOCKABILITY_ FACTOR_ PNW	COND	83	Plant stockability factor, Pacific Northwest Research Station
PLOT	BOUNDARY	7	Phase 2 Plot number
PLOT	COND	7	Phase 2 Plot number
PLOT	COND_DWM_CALC	4	Phase 2 Plot number
PLOT	DWM_COARSE_WOODY_ DEBRIS	6	Phase 2 Plot number
PLOT	DWM_DUFF_LITTER_FUEL	6	Phase 2 plot number
PLOT	DWM_FINE_WOODY DEBRIS	6	Phase 2 Plot number
PLOT	DWM_MICROPLOT_FUEL	6	Phase 2 plot number
PLOT	DWM_RESIDUAL_PILE	6	Phase 2 Plot number
PLOT	DWM_TRANSECT_SEGMENT	6	Phase 2 Plot number
PLOT	DWM_VISIT	6	Phase 2 Plot number
PLOT	INVASIVE_SUBPLOT_SPP	7	Phase 2 Plot number
PLOT	P2VEG_SUBP_STRUCTURE	6	Phase 2 Plot number
PLOT	P2VEG_SUBPLOT_SPP	7	Phase 2 Plot number
PLOT (1.3)	PLOT	9	Phase 2 Plot number
PLOT	PLOTGEOM	6	Phase 2 Plot number
PLOT	PLOTSNAP	9	Phase 2 Plot number
PLOT	POP_PLOT_STRATUM_ASSGN	8	Phase 2 Plot number
PLOT	SEEDLING	7	Phase 2 Plot number
PLOT	SITETREE	8	Phase 2 Plot number
PLOT	SUBPLOT	8	Phase 2 Plot number
PLOT	SUBP_COND	7	Phase 2 Plot number
PLOT	TREE	8	Phase 2 Plot number
PLOT_NONSAMPLE_REASN_ CD (1.5)	PLOT	11	Plot nonsampled reason code
PLOT_NONSAMPLE_REASN_ CD	PLOTSNAP	11	Plot nonsampled reason code
PLOT_STATUS_CD (1.4)	PLOT	10	Plot status code
PLOT_STATUS_CD	PLOTSNAP	10	Plot status code
PLT_CN	BOUNDARY	2	Plot sequence number
PLT_CN	COND	2	Plot sequence number
PLT_CN	COND_DWM_CALC	9	Plot sequence number
PLT_CN	DWM_COARSE_WOODY_ DEBRIS	2	Plot sequence number
PLT_CN	DWM_DUFF_LITTER_FUEL	2	Plot sequence number

Column name with (field guide section)	Table name	Location in table	Description
PLT_CN	DWM_FINE_WOODY DEBRIS	2	Plot sequence number
PLT_CN	DWM_MICROPLOT_FUEL	2	Plot sequence number
PLT_CN	DWM_RESIDUAL_PILE	2	Plot sequence number
PLT_CN	DWM_TRANSECT_SEGMENT	2	Plot sequence number
PLT_CN	DWM_VISIT	2	Plot sequence number
PLT_CN	INVASIVE_SUBPLOT_SPP	2	Plot sequence number
PLT_CN	P2VEG_SUBP_STRUCTURE	2	Plot sequence number
PLT_CN	P2VEG_SUBPLOT_SPP	2	Plot sequence number
PLT_CN	POP_PLOT_STRATUM_ASSGN	3	Plot sequence number
PLT_CN	SEEDLING	2	Plot sequence number
PLT_CN	SITETREE	2	Plot sequence number
PLT_CN	SUBPLOT	2	Plot sequence number
PLT_CN	SUBP_COND	2	Plot sequence number
PLT_CN	SUBP_COND_CHNG_MTRX	5	Plot sequence number
PLT_CN	TREE	2	Plot sequence number
PLT_CN	TREE_GRM_ESTN	4	Plot sequence number
POINT_NONSAMPLE_REASN_ CD (3.3)	SUBPLOT	11	Point nonsampled reason code
PPA_COND	DWM_RESIDUAL_PILE	25	Piles per acre, unadjusted, for condition estimates
PPA_PLOT	DWM_RESIDUAL_PILE	24	Piles per acre, unadjusted, for plot estimates
PPA_UNADJ	DWM_RESIDUAL_PILE	23	Piles per acre, unadjusted, for population estimates
PRESNFCD	COND	50	Present nonforest code
PREV_AFFORESTATION _CD (2.5.35)	COND	108	Previous afforestation code
PREV_PLT_CN	PLOT	4	Previous plot sequence number
PREV_PLT_CN	PLOTSNAP	4	Previous plot sequence number
PREV_PLT_CN	SUBP_COND_CHNG_MTRX	7	Previous plot sequence number
PREV_PNTN_SRS	TREE	142	Previous periodic prism point, tree number, Southern Research Station
PREV_SBP_CN	SUBPLOT	3	Previous subplot sequence number
PREV_SIT_CN	SITETREE	3	Previous site tree sequence number
PREV_STATUS_CD (5.6)	TREE	109	Previous tree status code
PREV_TRE_CN	TREE	3	Previous tree sequence number
PREV_WDLDSTEM (5.10)	TREE	110	Previous woodland tree species stem count
PREVCOND	SUBP_COND_CHNG_MTRX	8	Previous condition class number
PREVCOND	TREE	14	Previous condition class number
PREVDIA (5.9.1)	TREE	93	Previous diameter
PROP_BASIS	COND	28	Proportion basis
PUB_CD	REF_HABTYP_DESCRIPTION	3	Publication code

Column name with (field guide section)	Table name	Location in table	Description
PUB_CD	REF_HABTYP_PUBLICATION	2	Publication code
QASTATCD	DWM_VISIT	10	Quality assurance status code
QA_STATUS (1.17)	PLOT	32	Quality assurance status
QA_STATUS	PLOTSNAP	32	Quality assurance status
QUADRINOMIAL_AUTHOR	REF_PLANT_DICTIONARY	18	Quadrinomial author
R	TREE_GRM_ESTN	36	Reversion
RAILE_STUMP_DIB_B1	REF_SPECIES	60	Raile stump diameter inside bark equation coefficient B1
RAILE_STUMP_DIB_B2	REF_SPECIES	61	Raile stump diameter inside bark equation coefficient B2
RAILE_STUMP_DOB_B1	REF_SPECIES	59	Raile stump diameter outside bark equation coefficient B1
RDDISTCD (1.15)	PLOT	18	Horizontal distance to improved road code
RDDISTCD	PLOTSNAP	18	Horizontal distance to improved road code
RECONCILECD (5.7.1)	TREE	92	Reconcile code
REGION	REF_SPECIES_GROUP	3	Region
REGIONAL_DRYBIOM	TREE_REGIONAL_BIOMASS	4	Regional merchantable stem biomass oven-dry weight
REGIONAL_DRYBIOT	TREE_REGIONAL_BIOMASS	3	Regional total live tree biomass oven-dry weight
REMOVALS	TREE_GRM_ESTN	17	Removal estimate
REMPER	PLOT	15	Remeasurement period
REMPER	PLOTSNAP	15	Remeasurement period
REMPER	TREE_GRM_ESTN	12	Remeasurement period
REMVBFSL	TREE	52	Board-foot volume of a sawtimber-size tree on timberland for removal purposes
REMVCFAL	TREE	53	Sound cubic-foot volume of a tree on timberland for removal purposes
REMVCFGS	TREE	51	Cubic-foot volume of a growing-stock tree on timberland for removal purposes
REPORT_YEAR_NM	POP_EVAL	8	Report year name
RESERVCD (2.5.1)	COND	11	Reserved status code
RESERVCD_5	COND	103	Reserve code field
ROADLESSCD	PLOTGEOM	14	Roadless code
ROOT_DIS_SEV_CD_PNWRS	SUBPLOT	28	Root disease severity rating code, Pacific Northwest Research Station
ROUGHCULL (5.25)	TREE	89	Rough cull percentage
RSCD	COND_DWM_CALC	106	Region or Station code

Column name with (field guide section)	Table name	Location in table	Description
RSCD	POP_ESTN_UNIT	3	Region or Station code
RSCD	POP_EVAL	3	Region or Station code
RSCD	POP_EVAL_GRP	2	Region or Station code
RSCD	POP_PLOT_STRATUM_ ASSGN	9	Region or Station code
RSCD	POP_STRATUM	3	Region or Station code
RSCD	SURVEY	7	Region or Station code
RSNCTCD	DWM_FINE_WOODY DEBRIS	14	Reason count code
SALVCD	TREE	56	Salvable dead code
SAMP_METHOD_CD	PLOT	42	Sample method code
SAMP_METHOD_CD	PLOTSNAP	42	Sample method code
SAWHT	TREE	75	Sawlog height
SCIENTIFIC_NAME	REF_HABTYP_DESCRIPTION	4	Scientific name
SCIENTIFIC_NAME	REF_PLANT_DICTIONARY	4	Scientific name
SCIENTIFIC_NAME_W_ AUTHOR	REF_PLANT_DICTIONARY	15	Scientific name with author
SEGMNT	DWM_TRANSECT_SEGMENT	9	Segment number
SEVERITY1_CD_PNWRS	TREE	133	Damage severity 1, Pacific Northwest Research Station, for years 2001-2004
SEVERITY1A_CD_PNWRS	TREE	134	Damage Severity 1, Pacific Northwest Research Station
SEVERITY1B_CD_PNWRS	TREE	135	Damage severity B, Pacific Northwest Research Station
SEVERITY2_CD_PNWRS	TREE	136	Damage severity 2, Pacific Northwest Research Station, for years 2001-2004
SEVERITY2A_CD_PNWRS	TREE	137	Damage severity 2A, Pacific Northwest Research Station, starting in 2005
SEVERITY2B_CD_PNWRS	TREE	138	Damage severity in 2B, Pacific Northwest Research Station, starting in 2005
SEVERITY3_CD_PNWRS	TREE	139	Damage severity 3, Pacific Northwest Research Station, for years 2001-2004
SFTWD_HRDWD	REF_SPECIES	21	Softwood or hardwood
SHAPECD	DWM_RESIDUAL_PILE	11	Shape code
SIBASE	COND	24	Site index base age
SIBASE	SITETREE	17	Site index base age
SICOND	COND	23	Site index for the condition
SISP	COND	25	Site index species code
SITECL_METHOD	COND	66	Site class method
SITECLCD	COND	22	Site productivity class code

Column name with (field guide section)	Table name	Location in table	Description
SITECLCDEST	COND	64	Site productivity class code estimated
SITETREE	REF_SPECIES	20	Site tree
SITETREE_TREE	COND	65	Site tree tree number
SITREE	SITETREE	16	Site index for the tree
SITREE	TREE	80	Calculated site index
SITREE_EST	SITETREE	22	Estimated site index for the tree
SLOPE	COND	33	Slope
SLOPE	DWM_TRANSECT_SEGMENT	14	Percent slope
SLOPE (3.8)	SUBPLOT	16	Subplot slope
SLOPE_BEGNDIST	DWM_TRANSECT_SEGMENT	12	Beginning slope distance
SLOPE_ENDDIST	DWM_TRANSECT_SEGMENT	13	Ending slope distance
SLOPDIST	DWM_COARSE_WOODY_ DEBRIS	12	Slope distance
SMALL_TL_COND	DWM_FINE_WOODY DEBRIS	16	Small-size class transect length in condition
SMALL_TL_PLOT	DWM_FINE_WOODY DEBRIS	17	Small-size class transect length on plot
SMALL_TL_UNADJ	DWM_FINE_WOODY DEBRIS	18	Small-size class transect length on plot, unadjusted
SMALLCT	DWM_FINE_WOODY DEBRIS	11	Small-size class count
SMALLDIA	DWM_COARSE_WOODY_ DEBRIS	17	Small diameter
SMPKNDCD	DWM_VISIT	12	Sample kind code
SMPLDCD	DWM_DUFF_LITTER_FUEL	11	Sampled code
SMPLOCCD	DWM_DUFF_LITTER_FUEL	9	Sample location code
SOIL_ROOTING_DEPTH_PNW	COND	81	Soil rooting depth code, Pacific Northwest Research Station
SPCD	DWM_COARSE_WOODY_ DEBRIS	14	Species code
SPCD	REF_SPECIES	1	Species code
SPCD (6.2)	SEEDLING	10	Species code
SPCD (7.2.2)	SITETREE	11	Species code
SPCD (5.8)	TREE	16	Species code
SPECIES	REF_PLANT_DICTIONARY	22	Species
SPECIES	REF_SPECIES	4	Species name
SPECIES_SYMBOL	REF_SPECIES	7	Species symbol
SPGRPCD	REF_SPECIES_GROUP	1	Species group code
SPGRPCD	SEEDLING	11	Species group code
SPGRPCD	SITETREE	15	Species group code
SPGRPCD	TREE	17	Species group code
SRV_CN	PLOT	2	Survey sequence number
SRV_CN	PLOTSNAP	2	Survey sequence number
SSP	REF_PLANT_DICTIONARY	23	Subspecies indicator “ssp”
ST_EXISTS_IN_NCRS	REF_SPECIES	22	Site tree exists in the North Central Research Station region
ST_EXISTS_IN_NERS	REF_SPECIES	23	Site tree exists in the Northeastern Research Station region

Column name with (field guide section)	Table name	Location in table	Description
ST_EXISTS_IN_PNWRS	REF_SPECIES	24	Site tree exists in the Pacific Northwest Research Station region
ST_EXISTS_IN_RMRS	REF_SPECIES	25	Site tree exists in the Rocky Mountain Research Station region
ST_EXISTS_IN_SRS	REF_SPECIES	26	Site tree exists in the Southern Research Station region
STAND_STRUCTURE_SRS	COND	94	Stand structure, Southern Research Station
STANDING_DEAD_CD (5.7.2)	TREE	108	Standing dead code
STANDING_DEAD_DECAY_ RATIO1	REF_SPECIES	68	Standing dead decay ratio 1
STANDING_DEAD_DECAY_ RATIO2	REF_SPECIES	69	Standing dead decay ratio 2
STANDING_DEAD_DECAY_ RATIO3	REF_SPECIES	70	Standing dead decay ratio 3
STANDING_DEAD_DECAY_ RATIO4	REF_SPECIES	71	Standing dead decay ratio 4
STANDING_DEAD_DECAY_ RATIO5	REF_SPECIES	72	Standing dead decay ratio 5
START_DATE	REF_INVASIVE_SPECIES	6	Start date
START_INVYR	POP_EVAL	9	Start inventory year
STATEAB	SURVEY	5	State abbreviation
STATE_AND_PROVINCE	REF_PLANT_DICTIONARY	14	State and province
STATE_DISTRIBUTION	REF_PLANT_DICTIONARY	13	State distribution
STATECD	BOUNDARY	4	State code
STATECD	COND	4	State code
STATECD	COND_DWM_CALC	2	State code
STATECD	COUNTY	1	State code
STATECD	DWM_COARSE_WOODY_ DEBRIS	4	State code
STATECD	DWM_DUFF_LITTER_FUEL	4	State code
STATECD	DWM_FINE_WOODY DEBRIS	4	State code
STATECD	DWM_MICROPLOT_FUEL	4	State code
STATECD	DWM_RESIDUAL_PILE	4	State code
STATECD	DWM_TRANSECT_SEGMENT	4	State code
STATECD	DWM_VISIT	4	State code
STATECD	INVASIVE_SUBPLOT_SPP	4	State code
STATECD	P2VEG_SUBP_STRUCTURE	3	State code
STATECD	P2VEG_SUBPLOT_SPP	4	State code
STATECD (1.1)	PLOT	6	State code
STATECD	PLOTGEOM	2	State code
STATECD	PLOTSNAP	6	State code
STATECD	POP_ESTN_UNIT	7	State code
STATECD	POP_EVAL	6	State code
STATECD	POP_EVAL_ATTRIBUTE	4	State code
STATECD	POP_EVAL_GRP	5	State code
STATECD	POP_EVAL_TYP	4	State code
STATECD	POP_PLOT_STRATUM_ASSGN	4	State code
STATECD	POP_STRATUM	8	State code

Column name with (field guide section)	Table name	Location in table	Description
STATECD	REF_INVASIVE_SPECIES	2	State code
STATECD	REF_STATE_ELEV	1	State code
STATECD	REF_UNIT	1	State code
STATECD	SEEDLING	4	State code
STATECD	SITETREE	5	State code
STATECD	SUBPLOT	5	State code
STATECD	SUBP_COND	4	State code
STATECD	SUBP_COND_CHNG_MTRX	2	State code
STATECD	SURVEY	4	State code
STATECD	TREE	5	State code
STATECD	TREE_GRM_ESTN	2	State code
STATECD	TREE_REGIONAL_BIOMASS	2	State code
STATENM	SURVEY	6	State name
STATUSCD	TREE	15	Status code
STDAGE (2.5.10)	COND	19	Stand age
STDORGCD	COND	26	Stand origin code
STDORGSP	COND	27	Stand origin species code
STDSZCD	COND	20	Stand-size class code derived by algorithm
STND_COND_CD_PNWRS	COND	84	Stand condition code, Pacific Northwest Research Station
STND_STRUC_CD_PNWRS	COND	85	Stand structure code, Pacific Northwest Research Station
STOCKING	SEEDLING	12	Tree stocking
STOCKING	TREE	36	Tree stocking
STOCKING_SPGRPCD	REF_SPECIES	13	Stocking species group code
STRATUM_CN	COND_DWM_CALC	11	Stratum sequence number
STRATUM_CN	POP_PLOT_STRATUM_ASSGN	2	Stratum sequence number
STRATUM_DESCR	POP_STRATUM	7	Stratum description
STRATUMCD	POP_PLOT_STRATUM_ASSGN	12	Stratum code
STRATUMCD	POP_STRATUM	6	Stratum code
STUMP_CD_PNWRS	COND	86	Stump code, Pacific Northwest Research Station
SUBCYCLE	BOUNDARY	17	Inventory subcycle number
SUBCYCLE	COND	80	Inventory subcycle number
SUBCYCLE	COND_DWM_CALC	104	Inventory subcycle number
SUBCYCLE	INVASIVE_SUBPLOT_SPP	20	Inventory subcycle number
SUBCYCLE	P2VEG_SUBP_STRUCTURE	20	Inventory subcycle number
SUBCYCLE	P2VEG_SUBPLOT_SPP	23	Inventory subcycle number
SUBCYCLE	PLOT	47	Inventory subcycle number
SUBCYCLE	PLOTSNAP	47	Inventory subcycle number
SUBCYCLE	SEEDLING	24	Inventory subcycle number
SUBCYCLE	SITETREE	32	Inventory subcycle number
SUBCYCLE	SUBPLOT	27	Inventory subcycle number
SUBCYCLE	SUBP_COND	22	Inventory subcycle number
SUBCYCLE	SURVEY	17	Inventory subcycle number
SUBCYCLE	TREE	124	Inventory subcycle number
SUBP (4.2.1)	BOUNDARY	8	Subplot number

Column name with (field guide section)	Table name	Location in table	Description
SUBP	DWM_COARSE_WOODY_ DEBRIS	7	Subplot number
SUBP	DWM_DUFF_LITTER_FUEL	8	Subplot number
SUBP	DWM_FINE_WOODY DEBRIS	8	Subplot number
SUBP	DWM_MICROPLOT_FUEL	7	Subplot number
SUBP	DWM_RESIDUAL_PILE	7	Subplot number
SUBP	DWM_TRANSECT_SEGMENT	7	Subplot number
SUBP (9.4)	INVASIVE_SUBPLOT_SPP	8	Subplot number
SUBP (8.4.1)	P2VEG_SUBP_STRUCTURE	8	Subplot number
SUBP	P2VEG_SUBPLOT_SPP	8	Subplot number
SUBP (6.1)	SEEDLING	8	Subplot number
SUBP (7.2.7)	SITETREE	18	Subplot number
SUBP (3.1)	SUBPLOT	9	Subplot number
SUBP	SUBP_COND	8	Subplot number
SUBP	SUBP_COND_CHNG_MTRX	3	Subplot number
SUBP (5.1)	TREE	9	Subplot number
SUBP_EXAMINE_CD (1.9)	PLOT	43	Subplots examined code
SUBP_EXAMINE_CD	PLOTSNAP	43	Subplots examined code
SUBP_STATUS_CD (3.2)	SUBPLOT	10	Subplot status code
SUBPANEL	PLOT	30	Subpanel
SUBPANEL	PLOTSNAP	30	Subpanel
SUBPCOND (3.6)	SUBPLOT	13	Subplot center condition
SUBPCOND_PROP	SUBP_COND	17	Proportion of this subplot in this condition
SUBPPROP_UNADJ	COND	31	Subplot proportion unadjusted
SUBPTYP (4.2.2)	BOUNDARY	9	Subplot type code
SUBPTYP	SUBP_COND_CHNG_MTRX	4	Subplot type code
SUBTYP_GRM	TREE_GRM_ESTN	11	Subplot type used for GRM estimation
SUBPTYP_PROP_CHNG	SUBP_COND_CHNG_MTRX	9	Percent change of subplot condition between previous to current inventory
SUBSPECIES	REF_PLANT_DICTIONARY	25	Subspecies
SUBSPECIES	REF_SPECIES	6	Subspecies name
SUBVAR	REF_PLANT_DICTIONARY	29	Subspecies indicator “subvar”
SUBVARIETY	REF_PLANT_DICTIONARY	30	Subvariety
SYMBOL	REF_INVASIVE_SPECIES	3	Symbol
SYMBOL	REF_PLANT_DICTIONARY	3	Symbol
SYMBOL_TYPE	REF_PLANT_DICTIONARY	2	Symbol type
TITLE	REF_HABTYP_PUBLICATION	3	Title of publication
TIMBERLAND	REF_POP_ATTRIBUTE	4	Timberland
TIMBERLAND_ONLY	POP_EVAL	12	Timberland only
TOPO_POSITION_PNW	PLOT	49	Topographic position, Pacific Northwest Research Station
TOPO_POSITION_PNW	PLOTSNAP	49	Topographic position, Pacific Northwest Research Station
TOTAGE	SEEDLING	14	Total age of seedling

Column name with (field guide section)	Table name	Location in table	Description
TOTAGE	TREE	67	Total tree age
TPA_UNADJ	SEEDLING	22	Trees per acre unadjusted
TPA_UNADJ	TREE	111	Trees per acre unadjusted
TPAGROW_UNADJ	TREE	114	Growth trees per acre unadjusted for denied access, hazardous, out of sample conditions
TPAGROW_UNADJ	TREE_GRM_ESTN	13	Growth trees per acre unadjusted
TPAMORT_UNADJ	TREE	112	Mortality trees per acre per year unadjusted for denied access, hazardous, out of sample conditions
TPAMORT_UNADJ	TREE_GRM_ESTN	15	Mortality trees per acre per year unadjusted
TPAREMV_UNADJ	TREE	113	Removal trees per acre per year unadjusted for denied access, hazardous, out of sample conditions
TPRREMV_UNADJ	TREE_GRM_ESTN	14	Removal trees per acre per year unadjusted
TRANSCD (12.11)	TREE	63	Foliage transparency code
TRANSDIA	DWM_COARSE_WOODY_ DEBRIS	16	Transect diameter
TRANSECT	DWM_COARSE_WOODY_ DEBRIS	8	Transect
TRANSECT	DWM_FINE_WOODY DEBRIS	7	Transect
TRANSECT	DWM_DUFF_LITTER_FUEL	7	Transect
TRANSECT	DWM_TRANSECT_SEGMENT	8	Transect code
TRE_CN	TREE_GRM_ESTN	5	Tree sequence number
TRE_CN	TREE_REGIONAL_BIOMASS	1	Tree sequence number
TREE	SITETREE	10	Tree number
TREE (5.2)	TREE	10	Tree record number
TREECLCD	TREE	23	Tree class code
TREECLCD_NCRS	TREE	106	Tree class code, North Central Research Station
TREECLCD_NERS	TREE	104	Tree class code, Northeastern Research Station
TREECLCD_RMRS	TREE	107	Tree class code, Rocky Mountain Research Station
TREECLCD_SRS	TREE	105	Tree class code, Southern Research Station
TREECOUNT (6.4)	SEEDLING	13	Tree count for seedlings
TREECOUNT_CALC	SEEDLING	21	Tree count used in calculations
TREEGRCD	TREE	26	Tree grade code
TREEHISTCD	TREE	64	Tree history code
TRINOMIAL_AUTHOR	REF_PLANT_DICTIONARY	17	Trinomial author
TRTCD1 (2.5.17)	COND	44	Stand Treatment 1 code
TRTCD2 (2.5.19)	COND	46	Stand treatment 2 code
TRTCD3 (2.5.21)	COND	48	Stand Treatment 3 code

Column name with (field guide section)	Table name	Location in table	Description
TRTYR1 (2.5.18)	COND	45	Treatment year 1
TRTYR2 (2.5.20)	COND	47	Treatment year 2
TRTYR3 2.5.22)	COND	49	Treatment year 3
TYPE	REF_HABTYP_PUBLICATION	5	Type of publication
TYPGRPCD	REF_FOREST_TYPE	3	Forest type group code
UNCRCD (5.18, 12.5)	TREE	57	Uncompacted live crown ratio
UNIQUE_SP_NBR (9,10)	INVASIVE_SUBPLOT_SPP	10	Unique species number
UNIQUE_SP_NBR (8.6.3)	P2VEG_SUBPLOT_SPP	11	Unique species number
UNITCD	BOUNDARY	5	Survey unit code
UNITCD	COND	5	Survey unit code
UNITCD	COND_DWM_CALC	105	Survey unit code
UNITCD	COUNTY	2	Survey unit code
UNITCD	INVASIVE_SUBPLOT_SPP	5	Survey unit code
UNITCD	P2VEG_SUBP_STRUCTURE	4	Survey unit code
UNITCD	P2VEG_SUBPLOT_SPP	5	Survey unit code
UNITCD	PLOT	7	Survey unit code
UNITCD	PLOTGEOM	4	Survey unit code
UNITCD	PLOTSNAP	7	Survey unit code
UNITCD	POP_PLOT_STRATUM_ ASSGN	6	Survey unit code
UNITCD	SEEDLING	5	Survey unit code
UNITCD	SITETREE	6	Survey unit code
UNITCD	SUBPLOT	6	Survey unit code
UNITCD	SUBP_COND	5	Survey unit code
UNITCD	TREE	6	Survey unit code
UNITCD_LIST	REF_INVASIVE_SPECIES	5	Unit code list
UNKNOWN_DAMTYP1_PNWRS	TREE	140	Unknown damage type 1, Pacific Northwest Research Station
UNKNOWN_DAMTYP2_PNWRS	TREE	141	Unknown damage type 2, Pacific Northwest Research Station
US_NATIVITY	REF_PLANT_DICTIONARY	12	United States nativity
VALID	REF_HABTYP_DESCRIPTION	6	Valid
VALID	REF_HABTYP_PUBLICATION	6	Valid
VALIDCD	SITETREE	23	Validity code
VALUE	REF_FOREST_TYPE	1	Value
VALUE	REF_FOREST_TYPE_GROUP	1	Value
VALUE	REF_UNIT	2	Value
VAR	REF_PLANT_DICTIONARY	26	Variety indicator “var”
VARIETY	REF_PLANT_DICTIONARY	28	Variety
VARIETY	REF_SPECIES	5	Variety
VEG_FLDSPCD	INVASIVE_SUBPLOT_SPP	10	Vegetation field species code
VEG_FLDSPCD	P2VEG_SUBPLOT_SPP	10	Vegetation field species code
VEG_SPCD (9.9)	INVASIVE_SUBPLOT_SPP	11	Vegetation species code
VEG_SPCD (8.6.2)	P2VEG_SUBPLOT_SPP	12	Vegetation species code
VERSION	REF_FIADB_VERSION	1	Version number
VOL_LOC_GRP	COND	63	Volume location group
VOLBFGRS	TREE	43	Gross board-foot volume in the sawlog portion

Column name with (field guide section)	Table name	Location in table	Description
VOLBFNET	TREE	42	Net board-foot volume in the sawlog portion
VOLCF	DWM_COARSE_WOODY_ DEBRIS	22	Cubic foot volume of coarse woody debris piece
VOLCF	DWM_RESIDUAL_PILE	20	Gross cubic foot volume
VOLCFGRS	TREE	39	Gross cubic-foot volume
VOLCFNET	TREE	38	Net cubic-foot volume
VOLCFSND	TREE	44	Sound cubic-foot volume
VOLCSGRS	TREE	41	Gross cubic-foot volume in the sawlog portion
VOLCSNET	TREE	40	Net cubic-foot volume in the sawlog portion
W_SPGRPCD	REF_SPECIES	9	West species group code
WATERCD (1.16)	PLOT	19	Water on plot code
WATERCD	PLOTSNAP	19	Water on plot code
WATERDEP (3.10)	SUBPLOT	18	Water or snow depth
WDLDSTEM (5.11)	TREE	37	Woodland tree species current stem count
WEST	REF_SPECIES	29	West
WHERE_CLAUSE	REF_POP_ATTRIBUTE	7	Part of the where clause
WIDTH1	DWM_RESIDUAL_PILE	15	Width first measurement
WISTH2	DWM_RESIDUAL_PILE	18	Width second measurement
WOOD_SPGR_GREENVOL_ DRYWT	REF_SPECIES	47	Green specific gravity wood (green volume and oven-dry weight)
WOOD_SPGR_GREENVOL_ DRYWT_CIT	REF_SPECIES	48	Green specific gravity wood citation
WOOD_SPGR_MC12VOL_ DRYWT	REF_SPECIES	55	Wood specific gravity (12 percent moisture content volume and oven-dry weight)
WOOD_SPGR_MC12VOL_ DRYWT_ CIT	REF_SPECIES	56	Wood specific gravity (12 percent moisture content volume and oven-dry weight) citation
WOODLAND	REF_SPECIES	32	Woodland species
XGENUS	REF_PLANT_DICTIONARY	19	Cross genus
XSPECIES	REF_PLANT_DICTIONARY	21	Cross species
XSUBSPECIES	REF_PLANT_DICTIONARY	24	Cross subspecies
XVARIETY	REF_PLANT_DICTIONARY	27	Cross variety

Appendix B. State, Survey Unit, and County Codes

State Code: 1 **State Name:** Alabama **State Abbreviation:** AL **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Southwest-South

County code and county name					
3	Baldwin	53	Escambia	129	Washington
39	Covington	97	Mobile		

Survey Unit Code: 2 **Survey Unit Name**: Southwest-North

County code and county name							
23	Choctaw	35	Conecuh	99	Monroe	131	Wilcox
25	Clarke	91	Marengo	119	Sumter		

Survey Unit Code: 3 **Survey Unit Name**: Southeast

County code and county name							
1	Autauga	31	Coffee	67	Henry	109	Pike
5	Barbour	41	Crenshaw	69	Houston	113	Russell
11	Bullock	45	Dale	81	Lee	123	Tallapoosa
13	Butler	47	Dallas	85	Lowndes		
17	Chambers	51	Elmore	87	Macon		
21	Chilton	61	Geneva	101	Montgomery		

Survey Unit Code: 4 **Survey Unit Name**: West Central

County code and county name					
7	Bibb	65	Hale	105	Perry
57	Fayette	75	Lamar	107	Pickens
63	Greene	93	Marion	125	Tuscaloosa

Survey Unit Code: 5 **Survey Unit Name**: North Central

County code and county name							
9	Blount	29	Cleburne	73	Jefferson	121	Talladega
15	Calhoun	37	Coosa	111	Randolph	127	Walker
19	Cherokee	43	Cullman	115	St. Clair	133	Winston
27	Clay	55	Etowah	117	Shelby		

Survey Unit Code: 6 **Survey Unit Name**: North

County code and county name							
33	Colbert	71	Jackson	83	Limestone	103	Morgan
49	DeKalb	77	Lauderdale	89	Madison		
59	Franklin	79	Lawrence	95	Marshall		

State Code: 2 **State Name:** Alaska **State Abbreviation:** AK **Region/Station Code:** 27

Survey Unit Code: 1 **Survey Unit Name**: Alaska

County code and county name			
13	Aleutians East Borough	170	Matanuska-Susitna Borough
16	Aleutians West Census Area	180	Nome Census Area
20	Anchorage Borough	185	North Slope Borough
50	Bethel Census Area	188	Northwest Arctic Borough
60	Bristol Bay Borough	201	Prince of Wales-Outer Ketchikan Census Area
68	Denali Borough	220	Sitka Borough
70	Dillingham Census Area	232	Skagway-Hoonah-Angoon Census Area
90	Fairbanks North Star Borough	240	Southeast Fairbanks Census Area
100	Haines Borough	261	Valdez-Cordova Census Area
110	Juneau Borough	270	Wade Hampton Census Area
122	Kenai Peninsula Borough	280	Wrangell-Petersburg Census Area
130	Ketchikan Gateway Borough	282	Yakutat Borough
150	Kodiak Island Borough	290	Yukon-Koyukuk Census Area
164	Lake and Peninsula Borough		

State Code: 4 **State Name:** Arizona **State Abbreviation:** AZ **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Southern

County code and county name					
3	Cochise	12	La Paz	21	Pinal
9	Graham	13	Maricopa	23	Santa Cruz
11	Greenlee	19	Pima	27	Yuma

Survey Unit Code: 2 **Survey Unit Name**: Northern

County code and county name					
1	Apache	7	Gila	17	Navajo
5	Coconino	15	Mohave	25	Yavapai

State Code: 5 **State Name:** Arkansas **State Abbreviation:** AR **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: South Delta

County code and county name							
1	Arkansas	69	Jefferson	85	Lonoke	117	Prairie
17	Chicot	77	Lee	95	Monroe		
41	Desha	79	Lincoln	107	Phillips		

Survey Unit Code: 2 **Survey Unit Name**: North Delta

County code and county name							
21	Clay	37	Cross	75	Lawrence	123	St. Francis
31	Craighead	55	Greene	93	Mississippi	147	Woodruff
35	Crittenden	67	Jackson	111	Poinsett		

Survey Unit Code: 3 **Survey Unit Name**: Southwest

County code and county name							
3	Ashley	27	Columbia	59	Hot Spring	99	Nevada
11	Bradley	39	Dallas	61	Howard	103	Ouachita
13	Calhoun	43	Drew	73	Lafayette	109	Pike
19	Clark	53	Grant	81	Little River	133	Sevier
25	Cleveland	57	Hempstead	91	Miller	139	Union

Survey Unit Code: 4 **Survey Unit Name**: Ouachita

County code and county name							
51	Garland	105	Perry	125	Saline	149	Yell
83	Logan	113	Polk	127	Scott		
97	Montgomery	119	Pulaski	131	Sebastian		

Survey Unit Code: 5 **Survey Unit Name**: Ozark

County code and county name							
5	Baxter	33	Crawford	71	Johnson	129	Searcy
7	Benton	45	Faulkner	87	Madison	135	Sharp
9	Boone	47	Franklin	89	Marion	137	Stone
15	Carroll	49	Fulton	101	Newton	141	Van Buren
23	Cleburne	63	Independence	115	Pope	143	Washington
29	Conway	65	Izard	121	Randolph	145	White

State Code: 6 **State Name:** California **State Abbreviation:** CA **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: North Coast

County code and county name							
15	Del Norte	23	Humboldt	45	Mendocino	97	Sonoma

Survey Unit Code: 2 **Survey Unit Name**: North Interior

County code and county name							
35	Lassen	89	Shasta	105	Trinity		
49	Modoc	93	Siskiyou				

Survey Unit Code: 3 **Survey Unit Name**: Sacramento

County code and county name							
7	Butte	33	Lake	63	Plumas	103	Tehama
11	Colusa	55	Napa	67	Sacramento	113	Yolo
17	El Dorado	57	Nevada	91	Sierra	115	Yuba
21	Glenn	61	Placer	101	Sutter		

Survey Unit Code: 4 **Survey Unit Name**: Central Coast

County code and county name							
1	Alameda	69	San Benito	83	Santa Barbara	111	Ventura
13	Contra Costa	75	San Francisco	85	Santa Clara		
41	Marin	79	San Luis Obispo	87	Santa Cruz		
53	Monterey	81	San Mateo	95	Solano		

Survey Unit Code: 5 **Survey Unit Name**: San Joaquin

County code and county name							
3	Alpine	29	Kern	47	Merced	107	Tulare
5	Amador	31	Kings	51	Mono	109	Tuolumne
9	Calaveras	39	Madera	77	San Joaquin		
19	Fresno	43	Mariposa	99	Stanislaus		

Survey Unit Code: 6 **Survey Unit Name**: Southern

County code and county name							
25	Imperial	37	Los Angeles	65	Riverside	73	San Diego
27	Inyo	59	Orange	71	San Bernardino		

State Code: 8 **State Name:** Colorado **State Abbreviation:** CO **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Northern Front Range

County code and county name							
13	Boulder	35	Douglas	47	Gilpin	69	Larimer
14	Broomfield[a]	39	Elbert	59	Jefferson	93	Park
19	Clear Creek	41	El Paso	65	Lake	119	Teller

Survey Unit Code: 2 **Survey Unit Name**: Southern Front Range

County code and county name							
15	Chaffee	27	Custer	55	Huerfano	101	Pueblo
23	Costilla	43	Fremont	71	Las Animas		

Survey Unit Code: 3 **Survey Unit Name**: West Central

County code and county name							
3	Alamosa	51	Gunnison	97	Pitkin	111	San Juan
21	Conejos	53	Hinsdale	105	Rio Grande	117	Summit
37	Eagle	57	Jackson	107	Routt		
49	Grand	79	Mineral	109	Saguache		

Survey Unit Code: 4 **Survey Unit Name**: Western

County code and county name							
7	Archuleta	45	Garfield	81	Moffat	91	Ouray
29	Delta	67	La Plata	83	Montezuma	103	Rio Blanco
33	Dolores	77	Mesa	85	Montrose	113	San Miguel

Survey Unit Code: 5 **Survey Unit Name**: Eastern

County code and county name							
1	Adams	25	Crowley	75	Logan	115	Sedgwick
5	Arapahoe	31	Denver	87	Morgan	121	Washington
9	Baca	61	Kiowa	89	Otero	123	Weld
11	Bent	63	Kit Carson	95	Phillips	125	Yuma
17	Cheyenne	73	Lincoln	99	Prowers		

[a] This is a new county in the 2010 census, but is not currently added to the COUNTY table.

State Code: 9 **State Name:** Connecticut **State Abbreviation:** CT **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: Connecticut

County code and county name							
1	Fairfield	5	Litchfield	9	New Haven	13	Tolland
3	Hartford	7	Middlesex	11	New London	15	Windham

State Code: 10 **State Name:** Delaware **State Abbreviation:** DE **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: Delaware

County code and county name					
1	Kent	3	New Castle	5	Sussex

State Code: 11 **State Name:** District of Columbia **State Abbrev.:** DC **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: District of Columbia

State Code: 12 **State Name:** Florida **State Abbreviation:** FL **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Northeastern

County code and county name							
1	Alachua	31	Duval	79	Madison	123	Taylor
3	Baker	35	Flagler	83	Marion	125	Union
7	Bradford	41	Gilchrist	89	Nassau	127	Volusia
19	Clay	47	Hamilton	107	Putnam		
23	Columbia	67	Lafayette	109	St. Johns		
29	Dixie	75	Levy	121	Suwannee		

Survey Unit Code: 2 **Survey Unit Name**: Northwestern

County code and county name							
5	Bay	39	Gadsden	65	Jefferson	113	Santa Rosa
13	Calhoun	45	Gulf	73	Leon	129	Wakulla
33	Escambia	59	Holmes	77	Liberty	131	Walton
37	Franklin	63	Jackson	91	Okaloosa	133	Washington

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name							
9	Brevard	55	Highlands	93	Okeechobee	105	Polk
17	Citrus	57	Hillsborough	95	Orange	111	St. Lucie
27	DeSoto	61	Indian River	97	Osceola	115	Sarasota
49	Hardee	69	Lake	101	Pasco	117	Seminole
53	Hernando	81	Manatee	103	Pinellas	119	Sumter

Survey Unit Code: 4 **Survey Unit Name**: Southern

County code and county name							
11	Broward	25	Dade	71	Lee	99	Palm Beach
15	Charlotte	43	Glades	85	Martin		
21	Collier	51	Hendry	87	Monroe		

State Code: 13 **State Name:** Georgia **State Abbreviation:** GA **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Southeastern

County code and county name							
1	Appling	51	Chatham	161	Jeff Davis	251	Screven
3	Atkinson	65	Clinch	165	Jenkins	267	Tattnall
5	Bacon	69	Coffee	167	Johnson	271	Telfair
25	Brantley	91	Dodge	175	Laurens	279	Toombs
29	Bryan	101	Echols	179	Liberty	283	Treutlen
31	Bulloch	103	Effingham	183	Long	299	Ware
39	Camden	107	Emanuel	191	McIntosh	305	Wayne
43	Candler	109	Evans	209	Montgomery	309	Wheeler
49	Charlton	127	Glynn	229	Pierce		

Survey Unit Code: 2 **Survey Unit Name**: Southwestern

County code and county name							
7	Baker	81	Crisp	173	Lanier	277	Tift
17	Ben Hill	87	Decatur	185	Lowndes	287	Turner
19	Berrien	93	Dooly	201	Miller	315	Wilcox
27	Brooks	99	Early	205	Mitchell	321	Worth
71	Colquitt	131	Grady	253	Seminole		
75	Cook	155	Irwin	275	Thomas		

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name							
9	Baldwin	141	Hancock	211	Morgan	265	Taliaferro
21	Bibb	145	Harris	215	Muscogee	269	Taylor
23	Bleckley	153	Houston	225	Peach	273	Terrell
33	Burke	159	Jasper	231	Pike	289	Twiggs
35	Butts	163	Jefferson	235	Pulaski	293	Upson
37	Calhoun	169	Jones	237	Putnam	301	Warren
53	Chattahoochee	171	Lamar	239	Quitman	303	Washington
61	Clay	177	Lee	243	Randolph	307	Webster
73	Columbia	181	Lincoln	245	Richmond	317	Wilkes
79	Crawford	189	McDuffie	249	Schley	319	Wilkinson
95	Dougherty	193	Macon	259	Stewart		
125	Glascock	197	Marion	261	Sumter		
133	Greene	207	Monroe	263	Talbot		

Survey Unit Code: 4 **Survey Unit Name**: North Central

County code and county name							
11	Banks	97	Douglas	143	Haralson	219	Oconee
13	Barrow	105	Elbert	147	Hart	221	Oglethorpe
45	Carroll	113	Fayette	149	Heard	223	Paulding
59	Clarke	117	Forsyth	151	Henry	233	Polk
63	Clayton	119	Franklin	157	Jackson	247	Rockdale
67	Cobb	121	Fulton	195	Madison	255	Spalding
77	Coweta	135	Gwinnett	199	Meriwether	285	Troup
89	DeKalb	139	Hall	217	Newton	297	Walton

Georgia cont.

Georgia cont.

Survey Unit Code: 5 **Survey Unit Name**: Northern

County code and county name							
15	Bartow	111	Fannin	213	Murray	295	Walker
47	Catoosa	115	Floyd	227	Pickens	311	White
55	Chattooga	123	Gilmer	241	Rabun	313	Whitfield
57	Cherokee	129	Gordon	257	Stephens		
83	Dade	137	Habersham	281	Towns		
85	Dawson	187	Lumpkin	291	Union		

State Code: 15 **State Name:** Hawaii **State Abbreviation:** HI **Region/Station Code: 26**

Survey Unit Code: 1 **Survey Unit Name**: Hawaii

County code and county name					
1	Hawaii	5	Kalawao	9	Maui
3	Honolulu	7	Kauai		

State Code: 16 **State Name:** Idaho **State Abbreviation:** ID **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Northern

County code and county name							
9	Benewah	35	Clearwater	57	Latah	79	Shoshone
17	Bonner	49	Idaho	61	Lewis		
21	Boundary	55	Kootenai	69	Nez Perce		

Survey Unit Code: 2 **Survey Unit Name**: Southwestern

County code and county name							
1	Ada	27	Canyon	73	Owyhee	87	Washington
3	Adams	39	Elmore	75	Payette		
15	Boise	45	Gem	85	Valley		

Survey Unit Code: 3 **Survey Unit Name**: Southeastern

County code and county name							
5	Bannock	25	Camas	43	Fremont	65	Madison
7	Bear Lake	29	Caribou	47	Gooding	67	Minidoka
11	Bingham	31	Cassia	51	Jefferson	71	Oneida
13	Blaine	33	Clark	53	Jerome	77	Power
19	Bonneville	37	Custer	59	Lemhi	81	Teton
23	Butte	41	Franklin	63	Lincoln	83	Twin Falls

State Code: 17 **State Name:** Illinois **State Abbreviation:** IL **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Southern

County code and county name							
3	Alexander	69	Hardin	145	Perry	165	Saline
55	Franklin	77	Jackson	151	Pope	181	Union
59	Gallatin	87	Johnson	153	Pulaski	193	White
65	Hamilton	127	Massac	157	Randolph	199	Williamson

Survey Unit Code: 2 **Survey Unit Name**: Claypan

County code and county name							
5	Bond	47	Edwards	101	Lawrence	163	St. Clair
13	Calhoun	49	Effingham	117	Macoupin	173	Shelby
23	Clark	51	Fayette	119	Madison	185	Wabash
25	Clay	61	Greene	121	Marion	189	Washington
27	Clinton	79	Jasper	133	Monroe	191	Wayne
33	Crawford	81	Jefferson	135	Montgomery		
35	Cumberland	83	Jersey	159	Richland		

Survey Unit Code: 3 **Survey Unit Name**: Prairie

County code and county name							
1	Adams	53	Ford	105	Livingston	149	Pike
7	Boone	57	Fulton	107	Logan	155	Putnam
9	Brown	63	Grundy	109	McDonough	161	Rock Island
11	Bureau	67	Hancock	111	McHenry	167	Sangamon
15	Carroll	71	Henderson	113	McLean	169	Schuyler
17	Cass	73	Henry	115	Macon	171	Scott
19	Champaign	75	Iroquois	123	Marshall	175	Stark
21	Christian	85	Jo Daviess	125	Mason	177	Stephenson
29	Coles	89	Kane	129	Menard	179	Tazewell
31	Cook	91	Kankakee	131	Mercer	183	Vermilion
37	DeKalb	93	Kendall	137	Morgan	187	Warren
39	De Witt	95	Knox	139	Moultrie	195	Whiteside
41	Douglas	97	Lake	141	Ogle	197	Will
43	DuPage	99	La Salle	143	Peoria	201	Winnebago
45	Edgar	103	Lee	147	Piatt	203	Woodford

State Code: 18 **State Name:** Indiana **State Abbreviation:** IN **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Lower Wabash

County code and county name							
21	Clay	83	Knox	129	Posey	165	Vermillion
27	Daviess	101	Martin	133	Putnam	167	Vigo
51	Gibson	121	Parke	153	Sullivan		
55	Greene	125	Pike	163	Vanderburgh		

Survey Unit Code: 2 **Survey Unit Name**: Knobs

County code and county name							
13	Brown	61	Harrison	117	Orange	173	Warrick
19	Clark	71	Jackson	119	Owen	175	Washington
25	Crawford	93	Lawrence	123	Perry		
37	Dubois	105	Monroe	143	Scott		
43	Floyd	109	Morgan	147	Spencer		

Survey Unit Code: 3 **Survey Unit Name**: Upland Flats

County code and county name					
29	Dearborn	77	Jefferson	137	Ripley
41	Fayette	79	Jennings	155	Switzerland
47	Franklin	115	Ohio	161	Union

Survey Unit Code: 4 **Survey Unit Name**: Northern

County code and county name							
1	Adams	45	Fountain	87	Lagrange	139	Rush
3	Allen	49	Fulton	89	Lake	141	St. Joseph
5	Bartholomew	53	Grant	91	La Porte	145	Shelby
7	Benton	57	Hamilton	95	Madison	149	Starke
9	Blackford	59	Hancock	97	Marion	151	Steuben
11	Boone	63	Hendricks	99	Marshall	157	Tippecanoe
15	Carroll	65	Henry	103	Miami	159	Tipton
17	Cass	67	Howard	107	Montgomery	169	Wabash
23	Clinton	69	Huntington	111	Newton	171	Warren
31	Decatur	73	Jasper	113	Noble	177	Wayne
33	De Kalb	75	Jay	127	Porter	179	Wells
35	Delaware	81	Johnson	131	Pulaski	181	White
39	Elkhart	85	Kosciusko	135	Randolph	183	Whitley

State Code: 19 **State Name:** Iowa **State Abbreviation:** IA **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Northeastern

County code and county name							
5	Allamakee	31	Cedar	65	Fayette	105	Jones
11	Benton	37	Chickasaw	67	Floyd	113	Linn
13	Black Hawk	43	Clayton	75	Grundy	131	Mitchell
17	Bremer	45	Clinton	89	Howard	163	Scott
19	Buchanan	55	Delaware	97	Jackson	171	Tama
23	Butler	61	Dubuque	103	Johnson	191	Winneshiek

Survey Unit Code: 2 **Survey Unit Name**: Southeastern

County code and county name							
7	Appanoose	83	Hardin	121	Madison	177	Van Buren
15	Boone	87	Henry	123	Mahaska	179	Wapello
39	Clarke	95	Iowa	125	Marion	181	Warren
49	Dallas	99	Jasper	127	Marshall	183	Washington
51	Davis	101	Jefferson	135	Monroe	185	Wayne
53	Decatur	107	Keokuk	139	Muscatine	187	Webster
57	Des Moines	111	Lee	153	Polk		
77	Guthrie	115	Louisa	157	Poweshiek		
79	Hamilton	117	Lucas	169	Story		

Survey Unit Code: 3 **Survey Unit Name**: Southwestern

County code and county name							
1	Adair	47	Crawford	133	Monona	165	Shelby
3	Adams	71	Fremont	137	Montgomery	173	Taylor
9	Audubon	73	Greene	145	Page	175	Union
27	Carroll	85	Harrison	155	Pottawattamie	193	Woodbury
29	Cass	129	Mills	159	Ringgold		

Survey Unit Code: 4 **Survey Unit Name**: Northwestern

County code and county name							
21	Buena Vista	63	Emmet	119	Lyon	161	Sac
25	Calhoun	69	Franklin	141	O'Brien	167	Sioux
33	Cerro Gordo	81	Hancock	143	Osceola	189	Winnebago
35	Cherokee	91	Humboldt	147	Palo Alto	195	Worth
41	Clay	93	Ida	149	Plymouth	197	Wright
59	Dickinson	109	Kossuth	151	Pocahontas		

State Code: 20 **State Name:** Kansas **State Abbreviation:** KS **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Northeastern

County code and county name							
5	Atchison	59	Franklin	117	Marshall	177	Shawnee
13	Brown	61	Geary	121	Miami	197	Wabaunsee
27	Clay	85	Jackson	131	Nemaha	201	Washington
41	Dickinson	87	Jefferson	139	Osage	209	Wyandotte
43	Doniphan	91	Johnson	149	Pottawatomie		
45	Douglas	103	Leavenworth	161	Riley		

Survey Unit Code: 2 **Survey Unit Name**: Southeastern

County code and county name							
1	Allen	21	Cherokee	99	Labette	133	Neosho
3	Anderson	31	Coffey	107	Linn	205	Wilson
11	Bourbon	35	Cowley	111	Lyon	207	Woodson
15	Butler	37	Crawford	115	Marion		
17	Chase	49	Elk	125	Montgomery		
19	Chautauqua	73	Greenwood	127	Morris		

Survey Unit Code: 3 **Survey Unit Name**: Western

County code and county name							
7	Barber	71	Greeley	129	Morton	171	Scott
9	Barton	75	Hamilton	135	Ness	173	Sedgwick
23	Cheyenne	77	Harper	137	Norton	175	Seward
25	Clark	79	Harvey	141	Osborne	179	Sheridan
29	Cloud	81	Haskell	143	Ottawa	181	Sherman
33	Comanche	83	Hodgeman	145	Pawnee	183	Smith
39	Decatur	89	Jewell	147	Phillips	185	Stafford
47	Edwards	93	Kearny	151	Pratt	187	Stanton
51	Ellis	95	Kingman	153	Rawlins	189	Stevens
53	Ellsworth	97	Kiowa	155	Reno	191	Sumner
55	Finney	101	Lane	157	Republic	193	Thomas
57	Ford	105	Lincoln	159	Rice	195	Trego
63	Gove	109	Logan	163	Rooks	199	Wallace
65	Graham	113	McPherson	165	Rush	203	Wichita
67	Grant	119	Meade	167	Russell		
69	Gray	123	Mitchell	169	Saline		

State Code: 21 **State Name:** Kentucky **State Abbreviation:** KY **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Eastern

County code and county name							
71	Floyd	119	Knott	133	Letcher	193	Perry
95	Harlan	131	Leslie	159	Martin	195	Pike

Survey Unit Code: 2 **Survey Unit Name**: Northern Cumberland

County code and county name							
19	Boyd	115	Johnson	165	Menifee	237	Wolfe
43	Carter	127	Lawrence	175	Morgan		
63	Elliott	135	Lewis	197	Powell		
89	Greenup	153	Magoffin	205	Rowan		

Survey Unit Code: 3 **Survey Unit Name**: Southern Cumberland

County code and county name							
13	Bell	65	Estill	125	Laurel	189	Owsley
25	Breathitt	109	Jackson	129	Lee	203	Rockcastle
51	Clay	121	Knox	147	McCreary	235	Whitley

Survey Unit Code: 4 **Survey Unit Name**: Bluegrass

County code and county name							
5	Anderson	67	Fayette	113	Jessamine	187	Owen
11	Bath	69	Fleming	117	Kenton	191	Pendleton
15	Boone	73	Franklin	137	Lincoln	201	Robertson
17	Bourbon	77	Gallatin	151	Madison	209	Scott
21	Boyle	79	Garrard	161	Mason	211	Shelby
23	Bracken	81	Grant	167	Mercer	215	Spencer
37	Campbell	97	Harrison	173	Montgomery	223	Trimble
41	Carroll	103	Henry	181	Nicholas	229	Washington
49	Clark	111	Jefferson	185	Oldham	239	Woodford

Survey Unit Code: 5 **Survey Unit Name**: Pennyroyal

County code and county name							
1	Adair	57	Cumberland	99	Hart	179	Nelson
27	Breckinridge	85	Grayson	123	Larue	199	Pulaski
29	Bullitt	87	Green	155	Marion	207	Russell
45	Casey	91	Hancock	163	Meade	217	Taylor
53	Clinton	93	Hardin	169	Metcalfe	231	Wayne

Survey Unit Code: 6 **Survey Unit Name**: Western Coalfield

County code and county name							
3	Allen	55	Crittenden	141	Logan	213	Simpson
9	Barren	59	Daviess	149	McLean	219	Todd
31	Butler	61	Edmonson	171	Monroe	225	Union
33	Caldwell	101	Henderson	177	Muhlenberg	227	Warren
47	Christian	107	Hopkins	183	Ohio	233	Webster

Survey Unit Code: 7 **Survey Unit Name**: Western

County code and county name							
7	Ballard	75	Fulton	139	Livingston	157	Marshall
35	Calloway	83	Graves	143	Lyon	221	Trigg
39	Carlisle	105	Hickman	145	McCracken		

State Code: 22 **State Name:** Louisiana **State Abbreviation:** LA **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: North Delta

County code and county name					
25	Catahoula	41	Franklin	83	Richland
29	Concordia	65	Madison	107	Tensas
35	East Carroll	67	Morehouse	123	West Carroll

Survey Unit Code: 2 **Survey Unit Name**: South Delta

County code and county name							
1	Acadia	47	Iberville	77	Pointe Coupee	99	St. Martin
5	Ascension	51	Jefferson	87	St. Bernard	101	St. Mary
7	Assumption	55	Lafayette	89	St. Charles	109	Terrebonne
9	Avoyelles	57	Lafourche	93	St. James	113	Vermilion
23	Cameron	71	Orleans	95	St. John the Baptist	121	West Baton Rouge
45	Iberia	75	Plaquemines	97	St. Landry	125	West Feliciana

Survey Unit Code: 3 **Survey Unit Name**: Southwest

County code and county name							
3	Allen	39	Evangeline	59	La Salle	85	Sabine
11	Beauregard	43	Grant	69	Natchitoches	115	Vernon
19	Calcasieu	53	Jefferson Davis	79	Rapides		

Survey Unit Code: 4 **Survey Unit Name**: Southeast

County code and county name							
33	East Baton Rouge	63	Livingston	103	St. Tammany	117	Washington
37	East Feliciana	91	St. Helena	105	Tangipahoa		

Survey Unit Code: 5 **Survey Unit Name**: Northwest

County code and county name							
13	Bienville	27	Claiborne	73	Ouachita	127	Winn
15	Bossier	31	De Soto	81	Red River		
17	Caddo	49	Jackson	111	Union		
21	Caldwell	61	Lincoln	119	Webster		

State Code: 23 **State Name:** Maine **State Abbreviation:** ME **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: Washington

County code and county name
29 Washington

Survey Unit Code: 2 **Survey Unit Name**: Aroostook

County code and county name
3 Aroostook

Survey Unit Code: 3 **Survey Unit Name**: Penobscot

County code and county name
19 Penobscot

Survey Unit Code: 4 **Survey Unit Name**: Hancock

County code and county name
9 Hancock

Survey Unit Code: 5 **Survey Unit Name**: Piscataquis

County code and county name
21 Piscataquis

Survey Unit Code: 6 **Survey Unit Name**: Capitol Region

County code and county name							
11	Kennebec	13	Knox	15	Lincoln	27	Waldo

Survey Unit Code: 7 **Survey Unit Name**: Somerset

County code and county name
25 Somerset

Survey Unit Code: 8 **Survey Unit Name**: Casco Bay

County code and county name							
1	Androscoggin	5	Cumberland	23	Sagadahoc	31	York

Survey Unit Code: 9 **Survey Unit Name**: Western Maine

County code and county name			
7	Franklin	17	Oxford

State Code: 24 **State Name:** Maryland **State Abbreviation:** MD **Region/Station Code:** 24

Survey Unit Code: 2 **Survey Unit Name**: Central

County code and county name							
3	Anne Arundel	15	Cecil	29	Kent	41	Talbot
5	Baltimore	21	Frederick	31	Montgomery	43	Washington
11	Caroline	25	Harford	33	Prince George's	510	Baltimore city
13	Carroll	27	Howard	35	Queen Anne's		

Survey Unit Code: 3 **Survey Unit Name**: Southern

County code and county name					
09	Calvert	17	Charles	37	St. Mary's

Survey Unit Code: 4 **Survey Unit Name**: Lower Eastern Shore

County code and county name							
19	Dorchester	39	Somerset	45	Wicomico	47	Worcester

Survey Unit Code: 5 **Survey Unit Name**: Western

County code and county name			
1	Allegany	23	Garrett

State Code: 25 **State Name:** Massachusetts **State Abbreviation:** MA **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: Massachusetts

County code and county name							
1	Barnstable	9	Essex	17	Middlesex	25	Suffolk
3	Berkshire	11	Franklin	19	Nantucket	27	Worcester
5	Bristol	13	Hampden	21	Norfolk		
7	Dukes	15	Hampshire	23	Plymouth		

State Code: 26 **State Name:** Michigan **State Abbreviation:** MI **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Eastern Upper Peninsula

County code and county name							
3	Alger	41	Delta	97	Mackinac	153	Schoolcraft
33	Chippewa	95	Luce	109	Menominee		

Survey Unit Code: 2 **Survey Unit Name**: Western Upper Peninsula

County code and county name							
13	Baraga	53	Gogebic	71	Iron	103	Marquette
43	Dickinson	61	Houghton	83	Keweenaw	131	Ontonagon

Survey Unit Code: 3 **Survey Unit Name**: Northern Lower Peninsula

County code and county name							
1	Alcona	39	Crawford	101	Manistee	133	Osceola
7	Alpena	47	Emmet	105	Mason	135	Oscoda
9	Antrim	51	Gladwin	107	Mecosta	137	Otsego
11	Arenac	55	Grand Traverse	111	Midland	141	Presque Isle
17	Bay	69	Iosco	113	Missaukee	143	Roscommon
19	Benzie	73	Isabella	119	Montmorency	165	Wexford
29	Charlevoix	79	Kalkaska	123	Newaygo		
31	Cheboygan	85	Lake	127	Oceana		
35	Clare	89	Leelanau	129	Ogemaw		

Survey Unit Code: 4 **Survey Unit Name**: Southern Lower Peninsula

County code and county name							
5	Allegan	57	Gratiot	91	Lenawee	147	St. Clair
15	Barry	59	Hillsdale	93	Livingston	149	St. Joseph
21	Berrien	63	Huron	99	Macomb	151	Sanilac
23	Branch	65	Ingham	115	Monroe	155	Shiawassee
25	Calhoun	67	Ionia	117	Montcalm	157	Tuscola
27	Cass	75	Jackson	121	Muskegon	159	Van Buren
37	Clinton	77	Kalamazoo	125	Oakland	161	Washtenaw
45	Eaton	81	Kent	139	Ottawa	163	Wayne
49	Genesee	87	Lapeer	145	Saginaw		

State Code: 27 **State Name:** Minnesota **State Abbreviation:** MN **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Aspen-Birch

County code and county name					
17	Carlton	71	Koochiching	137	St. Louis
31	Cook	75	Lake		

Survey Unit Code: 2 **Survey Unit Name**: Northern Pine

County code and county name							
1	Aitkin	21	Cass	57	Hubbard	87	Mahnomen
5	Becker	29	Clearwater	61	Itasca	135	Roseau
7	Beltrami	35	Crow Wing	77	Lake of the Woods	159	Wadena

Survey Unit Code: 3 **Survey Unit Name**: Central Hardwood

County code and county name							
3	Anoka	49	Goodhue	97	Morrison	141	Sherburne
9	Benton	53	Hennepin	109	Olmsted	145	Stearns
19	Carver	55	Houston	111	Otter Tail	153	Todd
25	Chisago	59	Isanti	115	Pine	157	Wabasha
37	Dakota	65	Kanabec	123	Ramsey	163	Washington
41	Douglas	79	Le Sueur	131	Rice	169	Winona
45	Fillmore	95	Mille Lacs	139	Scott	171	Wright

Survey Unit Code: 4 **Survey Unit Name**: Prairie

County code and county name							
11	Big Stone	67	Kandiyohi	103	Nicollet	143	Sibley
13	Blue Earth	69	Kittson	105	Nobles	147	Steele
15	Brown	73	Lac qui Parle	107	Norman	149	Stevens
23	Chippewa	81	Lincoln	113	Pennington	151	Swift
27	Clay	83	Lyon	117	Pipestone	155	Traverse
33	Cottonwood	85	McLeod	119	Polk	161	Waseca
39	Dodge	89	Marshall	121	Pope	165	Watonwan
43	Faribault	91	Martin	125	Red Lake	167	Wilkin
47	Freeborn	93	Meeker	127	Redwood	173	Yellow Medicine
51	Grant	99	Mower	129	Renville		
63	Jackson	101	Murray	133	Rock		

State Code: 28 **State Name:** Mississippi **State Abbreviation:** MS **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Delta

County code and county name							
11	Bolivar	55	Issaquena	133	Sunflower	151	Washington
27	Coahoma	83	Leflore	135	Tallahatchie	163	Yazoo
51	Holmes	119	Quitman	143	Tunica		
53	Humphreys	125	Sharkey	149	Warren		

Survey Unit Code: 2 **Survey Unit Name**: North

County code and county name							
3	Alcorn	33	DeSoto	95	Monroe	139	Tippah
9	Benton	43	Grenada	97	Montgomery	141	Tishomingo
13	Calhoun	57	Itawamba	105	Oktibbeha	145	Union
15	Carroll	71	Lafayette	107	Panola	155	Webster
17	Chickasaw	81	Lee	115	Pontotoc	161	Yalobusha
19	Choctaw	87	Lowndes	117	Prentiss		
25	Clay	93	Marshall	137	Tate		

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name							
7	Attala	75	Lauderdale	103	Noxubee	129	Smith
23	Clarke	79	Leake	121	Rankin	159	Winston
61	Jasper	99	Neshoba	123	Scott		
69	Kemper	101	Newton	127	Simpson		

Survey Unit Code: 4 **Survey Unit Name**: South

County code and county name							
31	Covington	47	Harrison	77	Lawrence	147	Walthall
35	Forrest	59	Jackson	91	Marion	153	Wayne
39	George	65	Jefferson Davis	109	Pearl River		
41	Greene	67	Jones	111	Perry		
45	Hancock	73	Lamar	131	Stone		

Survey Unit Code: 5 **Survey Unit Name**: Southwest

County code and county name							
1	Adams	29	Copiah	63	Jefferson	113	Pike
5	Amite	37	Franklin	85	Lincoln	157	Wilkinson
21	Claiborne	49	Hinds	89	Madison		

State Code: 29 **State Name:** Missouri **State Abbreviation:** MO **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Eastern Ozarks

County code and county name							
17	Bollinger	65	Dent	179	Reynolds	221	Washington
23	Butler	93	Iron	181	Ripley	223	Wayne
35	Carter	123	Madison	187	St. Francois		
55	Crawford	149	Oregon	203	Shannon		

Survey Unit Code: 2 **Survey Unit Name**: Southwestern Ozarks

County code and county name							
9	Barry	91	Howell	153	Ozark	215	Texas
43	Christian	119	McDonald	209	Stone	225	Webster
67	Douglas	145	Newton	213	Taney	229	Wright

Survey Unit Code: 3 **Survey Unit Name**: Northwestern Ozarks

County code and county name							
15	Benton	85	Hickory	141	Morgan	185	St. Clair
29	Camden	105	Laclede	161	Phelps		
39	Cedar	125	Maries	167	Polk		
59	Dallas	131	Miller	169	Pulaski		

Survey Unit Code: 4 **Survey Unit Name**: Prairie

County code and county name							
1	Adair	53	Cooper	107	Lafayette	171	Putnam
3	Andrew	57	Dade	109	Lawrence	173	Ralls
5	Atchison	61	Daviess	111	Lewis	175	Randolph
7	Audrain	63	DeKalb	113	Lincoln	177	Ray
11	Barton	75	Gentry	115	Linn	195	Saline
13	Bates	77	Greene	117	Livingston	197	Schuyler
21	Buchanan	79	Grundy	121	Macon	199	Scotland
25	Caldwell	81	Harrison	127	Marion	205	Shelby
33	Carroll	83	Henry	129	Mercer	211	Sullivan
37	Cass	87	Holt	137	Monroe	217	Vernon
41	Chariton	95	Jackson	147	Nodaway	227	Worth
45	Clark	97	Jasper	159	Pettis		
47	Clay	101	Johnson	163	Pike		
49	Clinton	103	Knox	165	Platte		

Survey Unit Code: 5 **Survey Unit Name**: Riverborder

County code and county name							
19	Boone	73	Gasconade	143	New Madrid	189	St. Louis
27	Callaway	89	Howard	151	Osage	201	Scott
31	Cape Girardeau	99	Jefferson	155	Pemiscot	207	Stoddard
51	Cole	133	Mississippi	157	Perry	219	Warren
69	Dunklin	135	Moniteau	183	St. Charles	510	St. Louis city
71	Franklin	139	Montgomery	186	Ste. Genevieve		

State Code: 30 **State Name:** Montana **State Abbreviation:** MT **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Northwestern

County code and county name							
29	Flathead	47	Lake	53	Lincoln	89	Sanders

Survey Unit Code: 2 **Survey Unit Name**: Eastern

County code and county name							
3	Big Horn	27	Fergus	71	Phillips	95	Stillwater
5	Blaine	33	Garfield	73	Pondera	97	Sweet Grass
9	Carbon	35	Glacier	75	Powder River	99	Teton
11	Carter	37	Golden Valley	79	Prairie	101	Toole
15	Chouteau	41	Hill	83	Richland	103	Treasure
17	Custer	51	Liberty	85	Roosevelt	105	Valley
19	Daniels	55	McCone	87	Rosebud	109	Wibaux
21	Dawson	65	Musselshell	91	Sheridan	111	Yellowstone
25	Fallon	69	Petroleum				

Survey Unit Code: 3 **Survey Unit Name**: Western

County code and county name							
39	Granite	61	Mineral	63	Missoula	81	Ravalli

Survey Unit Code: 4 **Survey Unit Name**: West Central

County code and county name							
7	Broadwater	43	Jefferson	49	Lewis and Clark	77	Powell
13	Cascade	45	Judith Basin	59	Meagher	107	Wheatland

Survey Unit Code: 5 **Survey Unit Name**: Southwestern

County code and county name							
1	Beaverhead	31	Gallatin	67	Park		
23	Deer Lodge	57	Madison	93	Silver Bow		

State Code: 31 **State Name:** Nebraska **State Abbreviation:** NE **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Eastern

County code and county name							
1	Adams	55	Douglas	99	Kearney	151	Saline
11	Boone	59	Fillmore	109	Lancaster	153	Sarpy
19	Buffalo	61	Franklin	119	Madison	155	Saunders
21	Burt	63	Frontier	121	Merrick	159	Seward
23	Butler	65	Furnas	125	Nance	163	Sherman
25	Cass	67	Gage	127	Nemaha	167	Stanton
27	Cedar	73	Gosper	129	Nuckolls	169	Thayer
35	Clay	77	Greeley	131	Otoe	173	Thurston
37	Colfax	79	Hall	133	Pawnee	175	Valley
39	Cuming	81	Hamilton	137	Phelps	177	Washington
41	Custer	83	Harlan	139	Pierce	179	Wayne
43	Dakota	87	Hitchcock	141	Platte	181	Webster
47	Dawson	93	Howard	143	Polk	185	York
51	Dixon	95	Jefferson	145	Red Willow		
53	Dodge	97	Johnson	147	Richardson		

Survey Unit Code: 2 **Survey Unit Name**: Western

County code and county name							
3	Antelope	33	Cheyenne	91	Hooker	123	Morrill
5	Arthur	45	Dawes	101	Keith	135	Perkins
7	Banner	49	Deuel	103	Keya Paha	149	Rock
9	Blaine	57	Dundy	105	Kimball	157	Scotts Bluff
13	Box Butte	69	Garden	107	Knox	161	Sheridan
15	Boyd	71	Garfield	111	Lincoln	165	Sioux
17	Brown	75	Grant	113	Logan	171	Thomas
29	Chase	85	Hayes	115	Loup	183	Wheeler
31	Cherry	89	Holt	117	McPherson		

State Code: 32 **State Name:** Nevada **State Abbreviation:** NV **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Nevada

County code and county name							
1	Churchill	11	Eureka	21	Mineral	33	White Pine
3	Clark	13	Humboldt	23	Nye	510	Carson City
5	Douglas	15	Lander	27	Pershing		
7	Elko	17	Lincoln	29	Storey		
9	Esmeralda	19	Lyon	31	Washoe		

State Code: 33 **State Name:** New Hampshire **State Abbreviation:** NH **Region/Station Code:** 24

Survey Unit Code: 2 **Survey Unit Name**: Northern

County code and county name					
3	Carroll	7	Coos	9	Grafton

Survey Unit Code: 3 **Survey Unit Name**: Southern

County code and county name							
1	Belknap	11	Hillsborough	15	Rockingham	19	Sullivan
5	Cheshire	13	Merrimack	17	Strafford		

State Code: 34 **State Name:** New Jersey **State Abbreviation:** NJ **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: New Jersey

County code and county name							
1	Atlantic	13	Essex	25	Monmouth	37	Sussex
3	Bergen	15	Gloucester	27	Morris	39	Union
5	Burlington	17	Hudson	29	Ocean	41	Warren
7	Camden	19	Hunterdon	31	Passaic		
9	Cape May	21	Mercer	33	Salem		
11	Cumberland	23	Middlesex	35	Somerset		

State Code: 35 **State Name:** New Mexico **State Abbreviation:** NM **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Northwestern

County code and county name							
1	Bernalillo	31	McKinley	45	San Juan	61	Valencia
6	Cibola	39	Rio Arriba	49	Santa Fe		
28	Los Alamos	43	Sandoval	55	Taos		

Survey Unit Code: 2 **Survey Unit Name**: Northeastern

County code and county name							
7	Colfax	21	Harding	37	Quay	57	Torrance
19	Guadalupe	33	Mora	47	San Miguel	59	Union

Survey Unit Code: 3 **Survey Unit Name**: Southwestern

County code and county name							
3	Catron	17	Grant	29	Luna	53	Socorro
13	Dona Ana	23	Hidalgo	51	Sierra		

Survey Unit Code: 4 **Survey Unit Name**: Southeastern

County code and county name							
5	Chaves	11	De Baca	25	Lea	35	Otero
9	Curry	15	Eddy	27	Lincoln	41	Roosevelt

State Code: 36 **State Name:** New York **State Abbreviation:** NY **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: Adirondack

County code and county name							
19	Clinton	33	Franklin	45	Jefferson	89	St. Lawrence

Survey Unit Code: 2 **Survey Unit Name**: Lake Plain

County code and county name							
11	Cayuga	53	Madison	69	Ontario	117	Wayne
29	Erie	55	Monroe	73	Orleans	121	Wyoming
37	Genesee	63	Niagara	75	Oswego	123	Yates
51	Livingston	67	Onondaga	99	Seneca		

Survey Unit Code: 3 **Survey Unit Name**: Western Adirondack

County code and county name							
35	Fulton	43	Herkimer	49	Lewis	65	Oneida

Survey Unit Code: 4 **Survey Unit Name**: Eastern Adirondack

County code and county name							
31	Essex	41	Hamilton	113	Warren		

Survey Unit Code: 5 **Survey Unit Name**: Southwest Highlands

County code and county name							
3	Allegany	9	Cattaraugus	13	Chautauqua	101	Steuben

Survey Unit Code: 6 **Survey Unit Name**: South-Central Highlands

County code and county name							
7	Broome	23	Cortland	97	Schuyler		
15	Chemung	25	Delaware	107	Tioga		
17	Chenango	77	Otsego	109	Tompkins		

Survey Unit Code: 7 **Survey Unit Name**: Capitol District

County code and county name							
1	Albany	57	Montgomery	91	Saratoga	115	Washington
21	Columbia	83	Rensselaer	93	Schenectady		

Survey Unit Code: 8 **Survey Unit Name**: Catskill-Lower Hudson

County code and county name							
5	Bronx	59	Nassau	81	Queens	103	Suffolk
27	Dutchess	61	New York	85	Richmond	105	Sullivan
39	Greene	71	Orange	87	Rockland	111	Ulster
47	Kings	79	Putnam	95	Schoharie	119	Westchester

State Code: 37 **State Name:** North Carolina **State Abbreviation:** NC **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Southern Coastal Plain

County code and county name							
17	Bladen	85	Harnett	125	Moore	163	Sampson
19	Brunswick	93	Hoke	129	New Hanover	165	Scotland
47	Columbus	101	Johnston	133	Onslow	191	Wayne
51	Cumberland	103	Jones	141	Pender		
61	Duplin	105	Lee	153	Richmond		
79	Greene	107	Lenoir	155	Robeson		

Survey Unit Code: 2 **Survey Unit Name**: Northern Coastal Plain

County code and county name							
13	Beaufort	53	Currituck	95	Hyde	143	Perquimans
15	Bertie	55	Dare	117	Martin	147	Pitt
29	Camden	65	Edgecombe	127	Nash	177	Tyrrell
31	Carteret	73	Gates	131	Northampton	187	Washington
41	Chowan	83	Halifax	137	Pamlico	195	Wilson
49	Craven	91	Hertford	139	Pasquotank		

Survey Unit Code: 3 **Survey Unit Name**: Piedmont

County code and county name							
1	Alamance	59	Davie	119	Mecklenburg	167	Stanly
3	Alexander	63	Durham	123	Montgomery	169	Stokes
7	Anson	67	Forsyth	135	Orange	171	Surry
25	Cabarrus	69	Franklin	145	Person	179	Union
33	Caswell	71	Gaston	149	Polk	181	Vance
35	Catawba	77	Granville	151	Randolph	183	Wake
37	Chatham	81	Guilford	157	Rockingham	185	Warren
45	Cleveland	97	Iredell	159	Rowan	197	Yadkin
57	Davidson	109	Lincoln	161	Rutherford		

Survey Unit Code: 4 **Survey Unit Name**: Mountains

County code and county name							
5	Alleghany	39	Cherokee	111	McDowell	189	Watauga
9	Ashe	43	Clay	113	Macon	193	Wilkes
11	Avery	75	Graham	115	Madison	199	Yancey
21	Buncombe	87	Haywood	121	Mitchell		
23	Burke	89	Henderson	173	Swain		
27	Caldwell	99	Jackson	175	Transylvania		

State Code: 38 **State Name:** North Dakota **State Abbreviation:** ND **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Eastern

County code and county name							
1	Adams	29	Emmons	57	Mercer	85	Sioux
3	Barnes	31	Foster	59	Morton	87	Slope
5	Benson	33	Golden Valley	61	Mountrail	89	Stark
7	Billings	35	Grand Forks	63	Nelson	91	Steele
9	Bottineau	37	Grant	65	Oliver	93	Stutsman
11	Bowman	39	Griggs	67	Pembina	95	Towner
13	Burke	41	Hettinger	69	Pierce	97	Traill
15	Burleigh	43	Kidder	71	Ramsey	99	Walsh
17	Cass	45	LaMoure	73	Ransom	101	Ward
19	Cavalier	47	Logan	75	Renville	103	Wells
21	Dickey	49	McHenry	77	Richland	105	Williams
23	Divide	51	McIntosh	79	Rolette		
25	Dunn	53	McKenzie	81	Sargent		
27	Eddy	55	McLean	83	Sheridan		

State Code: 39 **State Name:** Ohio **State Abbreviation:** OH **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: South-Central

County code and county name							
1	Adams	53	Gallia	87	Lawrence	145	Scioto
15	Brown	71	Highland	131	Pike		
25	Clermont	79	Jackson	141	Ross		

Survey Unit Code: 2 **Survey Unit Name**: Southeastern

County code and county name							
9	Athens	105	Meigs	127	Perry	167	Washington
73	Hocking	115	Morgan	163	Vinton		

Survey Unit Code: 3 **Survey Unit Name**: East-Central

County code and county name							
13	Belmont	59	Guernsey	81	Jefferson	121	Noble
19	Carroll	67	Harrison	111	Monroe	157	Tuscarawas
31	Coshocton	75	Holmes	119	Muskingum		

Survey Unit Code: 4 **Survey Unit Name**: Northeastern

County code and county name							
5	Ashland	55	Geauga	103	Medina	155	Trumbull
7	Ashtabula	77	Huron	133	Portage	169	Wayne
29	Columbiana	85	Lake	139	Richland		
35	Cuyahoga	93	Lorain	151	Stark		
43	Erie	99	Mahoning	153	Summit		

Survey Unit Code: 5 **Survey Unit Name**: Southwestern

County code and county name							
17	Butler	45	Fairfield	61	Hamilton	113	Montgomery
23	Clark	47	Fayette	89	Licking	129	Pickaway
27	Clinton	49	Franklin	97	Madison	135	Preble
37	Darke	57	Greene	109	Miami	165	Warren

Survey Unit Code: 6 **Survey Unit Name**: Northwestern

County code and county name							
3	Allen	63	Hancock	107	Mercer	149	Shelby
11	Auglaize	65	Hardin	117	Morrow	159	Union
21	Champaign	69	Henry	123	Ottawa	161	Van Wert
33	Crawford	83	Knox	125	Paulding	171	Williams
39	Defiance	91	Logan	137	Putnam	173	Wood
41	Delaware	95	Lucas	143	Sandusky	175	Wyandot
51	Fulton	101	Marion	147	Seneca		

State Code: 40 **State Name:** Oklahoma **State Abbreviation:** OK **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Southeast

County code and county name							
5	Atoka	29	Coal	79	Le Flore	127	Pushmataha
13	Bryan	61	Haskell	89	McCurtain		
23	Choctaw	77	Latimer	121	Pittsburg		

Survey Unit Code: 2 **Survey Unit Name**: Northeast

County code and county name							
1	Adair	41	Delaware	97	Mayes	115	Ottawa
21	Cherokee	91	McIntosh	101	Muskogee	135	Sequoyah

Survey Unit Code: 3 **Survey Unit Name**: North Central

County code and county name							
35	Craig	113	Osage	131	Rogers	145	Wagoner
37	Creek	117	Pawnee	143	Tulsa	147	Washington
105	Nowata	119	Payne				

Survey Unit Code: 4 **Survey Unit Name**: South Central

County code and county name							
19	Carter	81	Lincoln	95	Marshall	111	Okmulgee
27	Cleveland	83	Logan	99	Murray	123	Pontotoc
49	Garvin	85	Love	107	Okfuskee	125	Pottawatomie
63	Hughes	87	McClain	109	Oklahoma	133	Seminole
69	Johnston						

Survey Unit Code: 5 **Survey Unit Name**: Southwest

County code and county name							
9	Beckham	33	Cotton	57	Harmon	129	Roger Mills
11	Blaine	39	Custer	65	Jackson	137	Stephens
15	Caddo	43	Dewey	67	Jefferson	141	Tillman
17	Canadian	51	Grady	73	Kingfisher	149	Washita
31	Comanche	55	Greer	75	Kiowa		

Survey Unit Code: 6 **Survey Unit Name**: High Plains

County code and county name							
7	Beaver	45	Ellis	59	Harper	139	Texas
25	Cimarron						

Survey Unit Code: 7 **Survey Unit Name**: Great Plains

County code and county name							
3	Alfalfa	53	Grant	93	Major	151	Woods
47	Garfield	71	Kay	103	Noble	153	Woodward

State Code: 41 **State Name:** Oregon **State Abbreviation:** OR **Region/Station Code:** 26

Survey Unit Code: 0 **Survey Unit Name**: Northwest

County code and county name							
5	Clackamas	27	Hood River	53	Polk	71	Yamhill
7	Clatsop	47	Marion	57	Tillamook		
9	Columbia	51	Multnomah	67	Washington		

Survey Unit Code: 1 **Survey Unit Name**: West Central

County code and county name							
3	Benton	39	Lane	41	Lincoln	43	Linn

Survey Unit Code: 2 **Survey Unit Name**: Southwest

County code and county name					
11	Coos	19	Douglas	33	Josephine
15	Curry	29	Jackson		

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name					
13	Crook	31	Jefferson	55	Sherman
17	Deschutes	35	Klamath	65	Wasco
21	Gilliam	37	Lake	69	Wheeler

Survey Unit Code: 4 **Survey Unit Name**: Blue Mountains

County code and county name							
1	Baker	25	Harney	49	Morrow	61	Union
23	Grant	45	Malheur	59	Umatilla	63	Wallowa

State Code: 42 **State Name:** Pennsylvania **State Abbreviation:** PA **Region/Station Code:** 24

Survey Unit Code: 0 **Survey Unit Name**: South Central

County code and county name					
43	Dauphin	61	Huntingdon	99	Perry
55	Franklin	67	Juniata	109	Snyder
57	Fulton	87	Mifflin	119	Union

Survey Unit Code: 5 **Survey Unit Name**: Western

County code and county name							
3	Allegheny	19	Butler	59	Greene	85	Mercer
5	Armstrong	39	Crawford	63	Indiana	125	Washington
7	Beaver	49	Erie	73	Lawrence	129	Westmoreland

Survey Unit Code: 6 **Survey Unit Name**: North Central/Allegheny

County code and county name							
23	Cameron	35	Clinton	81	Lycoming	117	Tioga
27	Centre	47	Elk	83	McKean	121	Venango
31	Clarion	53	Forest	105	Potter	123	Warren
33	Clearfield	65	Jefferson	113	Sullivan		

Survey Unit Code: 7 **Survey Unit Name**: Southwestern

County code and county name					
9	Bedford	21	Cambria	111	Somerset
13	Blair	51	Fayette		

Survey Unit Code: 8 **Survey Unit Name**: Northeastern/Pocono

County code and county name							
15	Bradford	79	Luzerne	103	Pike	131	Wyoming
25	Carbon	89	Monroe	107	Schuylkill		
37	Columbia	93	Montour	115	Susquehanna		
69	Lackawanna	97	Northumberland	127	Wayne		

Survey Unit Code: 9 **Survey Unit Name**: Southeastern

County code and county name							
1	Adams	41	Cumberland	77	Lehigh	133	York
11	Berks	45	Delaware	91	Montgomery		
17	Bucks	71	Lancaster	95	Northampton		
29	Chester	75	Lebanon	101	Philadelphia		

State Code: 44 **State Name:** Rhode Island **State Abbreviation:** RI **Region/Station Code:** 24

Survey Unit Code: 1 **Survey Unit Name**: Rhode Island

County code and county name					
1	Bristol	5	Newport	9	Washington
3	Kent	7	Providence		

State Code: 45 **State Name:** South Carolina **State Abbreviation:** SC **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Southern Coastal Plain

County code and county name							
3	Aiken	11	Barnwell	29	Colleton	53	Jasper
5	Allendale	13	Beaufort	35	Dorchester	63	Lexington
9	Bamberg	17	Calhoun	49	Hampton	75	Orangeburg

Survey Unit Code: 2 **Survey Unit Name**: Northern Coastal Plain

County code and county name							
15	Berkeley	31	Darlington	51	Horry	69	Marlboro
19	Charleston	33	Dillon	55	Kershaw	79	Richland
25	Chesterfield	41	Florence	61	Lee	85	Sumter
27	Clarendon	43	Georgetown	67	Marion	89	Williamsburg

Survey Unit Code: 3 **Survey Unit Name**: Piedmont

County code and county name							
1	Abbeville	39	Fairfield	65	McCormick	83	Spartanburg
7	Anderson	45	Greenville	71	Newberry	87	Union
21	Cherokee	47	Greenwood	73	Oconee	91	York
23	Chester	57	Lancaster	77	Pickens		
37	Edgefield	59	Laurens	81	Saluda		

State Code: 46 **State Name:** South Dakota **State Abbreviation:** SD **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Eastern

County code and county name							
3	Aurora	37	Day	71	Jackson	107	Potter
5	Beadle	39	Deuel	73	Jerauld	109	Roberts
7	Bennett	41	Dewey	75	Jones	111	Sanborn
9	Bon Homme	43	Douglas	77	Kingsbury	115	Spink
11	Brookings	45	Edmunds	79	Lake	117	Stanley
13	Brown	49	Faulk	83	Lincoln	119	Sully
15	Brule	51	Grant	85	Lyman	121	Todd
17	Buffalo	53	Gregory	87	McCook	123	Tripp
21	Campbell	55	Haakon	89	McPherson	125	Turner
23	Charles Mix	57	Hamlin	91	Marshall	127	Union
25	Clark	59	Hand	95	Mellette	129	Walworth
27	Clay	61	Hanson	97	Miner	135	Yankton
29	Codington	65	Hughes	99	Minnehaha	137	Ziebach
31	Corson	67	Hutchinson	101	Moody		
35	Davison	69	Hyde	105	Perkins		

Survey Unit Code: 2 **Survey Unit Name**: Western

County code and county name							
19	Butte	47	Fall River	81	Lawrence	103	Pennington
33	Custer	63	Harding	93	Meade	113	Shannon

State Code: 47 **State Name:** Tennessee **State Abbreviation:** TN **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: West

County code and county name							
17	Carroll	53	Gibson	95	Lake	157	Shelby
23	Chester	69	Hardeman	97	Lauderdale	167	Tipton
33	Crockett	75	Haywood	109	McNairy	183	Weakley
45	Dyer	77	Henderson	113	Madison		
47	Fayette	79	Henry	131	Obion		

Survey Unit Code: 2 **Survey Unit Name**: West Central

County code and county name							
5	Benton	81	Hickman	99	Lawrence	161	Stewart
39	Decatur	83	Houston	101	Lewis	181	Wayne
71	Hardin	85	Humphreys	135	Perry		

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name							
3	Bedford	41	DeKalb	117	Marshall	159	Smith
15	Cannon	43	Dickson	119	Maury	165	Sumner
21	Cheatham	55	Giles	125	Montgomery	169	Trousdale
27	Clay	87	Jackson	127	Moore	187	Williamson
31	Coffee	103	Lincoln	147	Robertson	189	Wilson
37	Davidson	111	Macon	149	Rutherford		

Survey Unit Code: 4 **Survey Unit Name**: Plateau

County code and county name							
7	Bledsoe	51	Franklin	133	Overton	153	Sequatchie
13	Campbell	61	Grundy	137	Pickett	175	Van Buren
35	Cumberland	115	Marion	141	Putnam	177	Warren
49	Fentress	129	Morgan	151	Scott	185	White

Survey Unit Code: 5 **Survey Unit Name**: East

County code and county name							
1	Anderson	59	Greene	93	Knox	145	Roane
9	Blount	63	Hamblen	105	Loudon	155	Sevier
11	Bradley	65	Hamilton	107	McMinn	163	Sullivan
19	Carter	67	Hancock	121	Meigs	171	Unicoi
25	Claiborne	73	Hawkins	123	Monroe	173	Union
29	Cocke	89	Jefferson	139	Polk	179	Washington
57	Grainger	91	Johnson	143	Rhea		

State Code: 48 **State Name:** Texas **State Abbreviation:** TX **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Southeast

County code and county name							
5	Angelina	241	Jasper	351	Newton	455	Trinity
71	Chambers	245	Jefferson	361	Orange	457	Tyler
185	Grimes	289	Leon	373	Polk	471	Walker
199	Hardin	291	Liberty	403	Sabine	473	Waller
201	Harris	313	Madison	405	San Augustine		
225	Houston	339	Montgomery	407	San Jacinto		

Survey Unit Code: 2 **Survey Unit Name**: Northeast

County code and county name							
1	Anderson	183	Gregg	365	Panola	459	Upshur
37	Bowie	203	Harrison	387	Red River	467	Van Zandt
63	Camp	213	Henderson	401	Rusk	499	Wood
67	Cass	315	Marion	419	Shelby		
73	Cherokee	343	Morris	423	Smith		
159	Franklin	347	Nacogdoches	449	Titus		

Survey Unit Code: 3 **Survey Unit Name**: North Central

County code and county name							
15	Austin	121	Denton	217	Hill	337	Montague
21	Bastrop	123	De Witt	223	Hopkins	349	Navarro
41	Brazos	139	Ellis	231	Hunt	367	Parker
51	Burleson	145	Falls	237	Jack	379	Rains
55	Caldwell	147	Fannin	251	Johnson	395	Robertson
77	Clay	149	Fayette	257	Kaufman	397	Rockwall
85	Collin	161	Freestone	277	Lamar	439	Tarrant
89	Colorado	175	Goliad	285	Lavaca	477	Washington
97	Cooke	177	Gonzales	287	Lee	497	Wise
113	Dallas	181	Grayson	293	Limestone	503	Young
119	Delta	187	Guadalupe	331	Milam		

Survey Unit Code: 4 **Survey Unit Name**: South

County code and county name							
7	Aransas	157	Fort Bend	273	Kleberg	427	Starr
13	Atascosa	163	Frio	283	La Salle	469	Victoria
25	Bee	167	Galveston	297	Live Oak	479	Webb
39	Brazoria	215	Hidalgo	311	McMullen	481	Wharton
47	Brooks	239	Jackson	321	Matagorda	489	Willacy
57	Calhoun	247	Jim Hogg	323	Maverick	493	Wilson
61	Cameron	249	Jim Wells	355	Nueces	505	Zapata
127	Dimmit	255	Karnes	391	Refugio	507	Zavala
131	Duval	261	Kenedy	409	San Patricio		

Texas cont.

Texas cont.

Survey Unit Code: 5 **Survey Unit Name**: West Central

County code and county name							
19	Bandera	99	Coryell	267	Kimble	385	Real
27	Bell	105	Crockett	271	Kinney	399	Runnels
29	Bexar	133	Eastland	281	Lampasas	411	San Saba
31	Blanco	137	Edwards	299	Llano	413	Schleicher
35	Bosque	143	Erath	307	McCulloch	425	Somervell
49	Brown	171	Gillespie	309	McLennan	429	Stephens
53	Burnet	193	Hamilton	319	Mason	435	Sutton
59	Callahan	209	Hays	325	Medina	453	Travis
83	Coleman	221	Hood	327	Menard	463	Uvalde
91	Comal	259	Kendall	333	Mills	465	Val Verde
93	Comanche	265	Kerr	363	Palo Pinto	491	Williamson
95	Concho						

Survey Unit Code: 6 **Survey Unit Name**: Northwest

County code and county name							
3	Andrews	129	Donley	235	Irion	375	Potter
9	Archer	151	Fisher	253	Jones	381	Randall
11	Armstrong	153	Floyd	263	Kent	383	Reagan
17	Bailey	155	Foard	269	King	393	Roberts
23	Baylor	165	Gaines	275	Knox	415	Scurry
33	Borden	169	Garza	279	Lamb	417	Shackelford
45	Briscoe	173	Glasscock	295	Lipscomb	421	Sherman
65	Carson	179	Gray	303	Lubbock	431	Sterling
69	Castro	189	Hale	305	Lynn	433	Stonewall
75	Childress	191	Hall	317	Martin	437	Swisher
79	Cochran	195	Hansford	329	Midland	441	Taylor
81	Coke	197	Hardeman	335	Mitchell	445	Terry
87	Collingsworth	205	Hartley	341	Moore	447	Throckmorton
101	Cottle	207	Haskell	345	Motley	451	Tom Green
107	Crosby	211	Hemphill	353	Nolan	483	Wheeler
111	Dallam	219	Hockley	357	Ochiltree	485	Wichita
115	Dawson	227	Howard	359	Oldham	487	Wilbarger
117	Deaf Smith	233	Hutchinson	369	Parmer	501	Yoakum
125	Dickens						

Survey Unit Code: 7 **Survey Unit Name**: West

County code and county name							
43	Brewster	141	El Paso	371	Pecos	461	Upton
103	Crane	229	Hudsbeth	377	Presidio	475	Ward
109	Culberson	243	Jeff Davis	389	Reeves	495	Winkler
135	Ector	301	Loving	443	Terrell		

State Code: 49 **State Name:** Utah **State Abbreviation:** UT **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Northern

County code and county name							
3	Box Elder	29	Morgan	43	Summit	51	Wasatch
5	Cache	33	Rich	45	Tooele	57	Weber
11	Davis	35	Salt Lake	49	Utah		

Survey Unit Code: 2 **Survey Unit Name**: Uinta

County code and county name					
9	Daggett	13	Duchesne	47	Uintah

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name					
23	Juab	31	Piute	41	Sevier
27	Millard	39	Sanpete	55	Wayne

Survey Unit Code: 4 **Survey Unit Name**: Eastern

County code and county name							
7	Carbon	15	Emery	19	Grand	37	San Juan

Survey Unit Code: 5 **Survey Unit Name**: Southwestern

County code and county name					
1	Beaver	21	Iron	53	Washington
17	Garfield	25	Kane		

State Code: 50 **State Name:** Vermont **State Abbreviation:** VT **Region/Station Code:** 24

Survey Unit Code: 2 **Survey Unit Name**: Northern

County code and county name							
5	Caledonia	11	Franklin	15	Lamoille	19	Orleans
9	Essex	13	Grand Isle	17	Orange	23	Washington

Survey Unit Code: 3 **Survey Unit Name**: Southern

County code and county name					
1	Addison	7	Chittenden	25	Windham
3	Bennington	21	Rutland	27	Windsor

State Code: 51 **State Name:** Virginia **State Abbreviation:** VA **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Coastal Plain

County code and county name							
1	Accomack	85	Hanover	119	Middlesex	193	Westmoreland
25	Brunswick	87	Henrico	127	New Kent	199	York
33	Caroline	93	Isle Of Wight	131	Northampton	550	Chesapeake city
36	Charles City	95	James City	133	Northumberland	650	Hampton city
41	Chesterfield	97	King And Queen	149	Prince George	700	Newport News city
53	Dinwiddie	99	King George	159	Richmond	800	Suffolk city
57	Essex	101	King William	175	Southampton	810	Virginia Beach city
73	Gloucester	103	Lancaster	181	Surry		
81	Greensville	115	Mathews	183	Sussex		

Survey Unit Code: 2 **Survey Unit Name**: Southern Piedmont

County code and county name							
7	Amelia	37	Charlotte	111	Lunenburg	145	Powhatan
11	Appomattox	49	Cumberland	117	Mecklenburg	147	Prince Edward
19	Bedford	67	Franklin	135	Nottoway		
29	Buckingham	83	Halifax	141	Patrick		
31	Campbell	89	Henry	143	Pittsylvania		

Survey Unit Code: 3 **Survey Unit Name**: Northern Piedmont

County code and county name							
3	Albemarle	61	Fauquier	109	Louisa	157	Rappahannock
9	Amherst	65	Fluvanna	113	Madison	177	Spotsylvania
13	Arlington	75	Goochland	125	Nelson	179	Stafford
47	Culpeper	79	Greene	137	Orange		
59	Fairfax	107	Loudoun	153	Prince William		

Survey Unit Code: 4 **Survey Unit Name**: Northern Mountains

County code and county name							
5	Alleghany	43	Clarke	139	Page	171	Shenandoah
15	Augusta	45	Craig	161	Roanoke	187	Warren
17	Bath	69	Frederick	163	Rockbridge		
23	Botetourt	91	Highland	165	Rockingham		

Survey Unit Code: 5 **Survey Unit Name**: Southern Mountains

County code and county name							
21	Bland	71	Giles	167	Russell	195	Wise
27	Buchanan	77	Grayson	169	Scott	197	Wythe
35	Carroll	105	Lee	173	Smyth		
51	Dickenson	121	Montgomery	185	Tazewell		
63	Floyd	155	Pulaski	191	Washington		

Virginia cont.

Virginia cont.

Cities aggregated into other counties

City code and city name	Associated county code and county name	City code and city name	Associated county code and county name
510 Alexandria city	59 Fairfax	683 Manassas city	153 Prince William
515 Bedford city	19 Bedford	685 Manassas Park city	153 Prince William
520 Bristol city	191 Washington	690 Martinsville city	89 Henry
530 Buena Vista city	163 Rockbridge	710 Norfolk city	550 Chesapeake City
540 Charlottesville city	3 Albemarle	720 Norton city	195 Wise
560 Clifton Forge city	5 Allegheny	730 Petersburg city	53 Dinwiddie
570 Colonial Heights city	41 Chesterfield	730 Petersburg city	149 Prince George
580 Covington city	5 Allegheny	735 Poquoson city	199 York
590 Danville city	143 Pittsylvania	740 Portsmouth city	550 Chesapeake City
595 Emporia city	81 Greensville	750 Radford city	121 Montgomery
600 Fairfax city	59 Fairfax	760 Richmond city	41 Chesterfield
610 Falls Church city	59 Fairfax	760 Richmond city	87 Henrico
620 Franklin city	175 Southampton	770 Roanoke city	161 Roanoke
630 Fredericksburg city	177 Spotsylvania	775 Salem city	161 Roanoke
640 Galax city	35 Carroll	780 South Boston city	83 Halifax
640 Galax city	77 Grayson	790 Staunton city	15 Augusta
660 Harrisonburg city	165 Rockingham	820 Waynesboro city	15 Augusta
670 Hopewell city	149 Prince George	830 Williamsburg city	95 County of James City
678 Lexington city	163 Rockbridge	840 Winchester city	69 Frederick
680 Lynchburg city	31 Campbell		

State Code: 53 **State Name:** Washington **State Abbreviation:** WA **Region/Station Code:** 26

Survey Unit Code: 5 **Survey Unit Name**: Puget Sound

County code and county name							
29	Island	35	Kitsap	55	San Juan	61	Snohomish
33	King	53	Pierce	57	Skagit	73	Whatcom

Survey Unit Code: 6 **Survey Unit Name**: Olympic Peninsula

County code and county name					
9	Clallam	31	Jefferson	67	Thurston
27	Grays Harbor	45	Mason		

Survey Unit Code: 7 **Survey Unit Name**: Southwest

County code and county name					
11	Clark	41	Lewis	59	Skamania
15	Cowlitz	49	Pacific	69	Wahkiakum

Survey Unit Code: 8 **Survey Unit Name**: Central

County code and county name					
7	Chelan	37	Kittitas	47	Okanogan
17	Douglas	39	Klickitat	77	Yakima

Survey Unit Code: 9 **Survey Unit Name**: Inland Empire

County code and county name							
1	Adams	19	Ferry	43	Lincoln	71	Walla Walla
3	Asotin	21	Franklin	51	Pend Oreille	75	Whitman
5	Benton	23	Garfield	63	Spokane		
13	Columbia	25	Grant	65	Stevens		

State Code: 54 **State Name:** West Virginia **State Abbreviation:** WV **Region/Station Code:** 24

Survey Unit Code: 2 **Survey Unit Name**: Northeastern

County code and county name							
1	Barbour	31	Hardy	65	Morgan	91	Taylor
3	Berkeley	33	Harrison	71	Pendleton	93	Tucker
7	Braxton	37	Jefferson	75	Pocahontas	97	Upshur
23	Grant	41	Lewis	77	Preston	101	Webster
27	Hampshire	57	Mineral	83	Randolph		

Survey Unit Code: 3 **Survey Unit Name**: Southern

County code and county name							
5	Boone	39	Kanawha	59	Mingo	89	Summers
15	Clay	45	Logan	63	Monroe	109	Wyoming
19	Fayette	47	McDowell	67	Nicholas		
25	Greenbrier	55	Mercer	81	Raleigh		

Survey Unit Code: 4 **Survey Unit Name**: Northwestern

County code and county name							
9	Brooke	35	Jackson	69	Ohio	99	Wayne
11	Cabell	43	Lincoln	73	Pleasants	103	Wetzel
13	Calhoun	49	Marion	79	Putnam	105	Wirt
17	Doddridge	51	Marshall	85	Ritchie	107	Wood
21	Gilmer	53	Mason	87	Roane		
29	Hancock	61	Monongalia	95	Tyler		

State Code: 55 **State Name:** Wisconsin **State Abbreviation:** WI **Region/Station Code:** 23

Survey Unit Code: 1 **Survey Unit Name**: Northeastern

County code and county name							
37	Florence	69	Lincoln	83	Oconto	125	Vilas
41	Forest	75	Marinette	85	Oneida		
67	Langlade	78	Menominee	115	Shawano		

Survey Unit Code: 2 **Survey Unit Name**: Northwestern

County code and county name							
3	Ashland	13	Burnett	95	Polk	113	Sawyer
5	Barron	31	Douglas	99	Price	119	Taylor
7	Bayfield	51	Iron	107	Rusk	129	Washburn

Survey Unit Code: 3 **Survey Unit Name**: Central

County code and county name							
1	Adams	53	Jackson	81	Monroe	141	Wood
17	Chippewa	57	Juneau	97	Portage		
19	Clark	73	Marathon	135	Waupaca		
35	Eau Claire	77	Marquette	137	Waushara		

Survey Unit Code: 4 **Survey Unit Name**: Southwestern

County code and county name							
11	Buffalo	49	Iowa	93	Pierce	121	Trempealeau
23	Crawford	63	La Crosse	103	Richland	123	Vernon
33	Dunn	65	Lafayette	109	St. Croix		
43	Grant	91	Pepin	111	Sauk		

Survey Unit Code: 5 **Survey Unit Name**: Southeastern

County code and county name							
9	Brown	39	Fond du Lac	71	Manitowoc	117	Sheboygan
15	Calumet	45	Green	79	Milwaukee	127	Walworth
21	Columbia	47	Green Lake	87	Outagamie	131	Washington
25	Dane	55	Jefferson	89	Ozaukee	133	Waukesha
27	Dodge	59	Kenosha	101	Racine	139	Winnebago
29	Door	61	Kewaunee	105	Rock		

State Code: 56 **State Name:** Wyoming **State Abbreviation:** WY **Region/Station Code:** 22

Survey Unit Code: 1 **Survey Unit Name**: Western

County code and county name							
13	Fremont	23	Lincoln	35	Sublette	39	Teton
17	Hot Springs	29	Park	37	Sweetwater	41	Uinta

Survey Unit Code: 2 **Survey Unit Name**: Central and Southeastern

County code and county name							
1	Albany	9	Converse	21	Laramie	31	Platte
3	Big Horn	15	Goshen	25	Natrona	33	Sheridan
7	Carbon	19	Johnson	27	Niobrara	43	Washakie

Survey Unit Code: 3 **Survey Unit Name**: Northeastern

County code and county name					
5	Campbell	11	Crook	45	Weston

State Code: 60 **State Name:** American Samoa **State Abbreviation:** AS **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: American Samoa

County code and county name					
10	Tutuila East	30	Rose	50	Tutuila West
20	Manu'a	40	Swains		

State Code: 64 **State Name:** Federated States of Micronesia **State Abbreviation:** FM **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: Federated States of Micronesia

County code and county name							
2	Chuuk	5	Kosrae	40	Pohnpei	60	Yap

State Code: 66 **State Name:** Guam **State Abbreviation:** GU **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: Guam

County code and county name	
10	Guam

State Code: 68 **State Name:** Marshall Islands **State Abbreviation:** MH **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: Marshall Islands

County code and county name							
7	Ailinginae	90	Enewetak	170	Lib	350	Rongelap
10	Ailinglaplap	100	Erikub	180	Likiep	360	Rongrik
30	Ailuk	110	Jabat	190	Majuro	385	Toke
40	Arno	120	Jaluit	300	Maloelap	390	Ujae
50	Aur	130	Jemo	310	Mejit	400	Ujelang
60	Bikar	140	Kili	320	Mili	410	Utrik
70	Bikini	150	Kwajalein	330	Namorik	420	Wotho
73	Bokak	160	Lae	340	Namu	430	Wotje
80	Ebon						

State Code: 69 **State Name:** Northern Mariana Islands **State Abbreviation:** MP **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: Northern Mariana Islands

County code and county name							
85	Northern Islands	100	Rota	110	Saipan	120	Tinian

State Code: 70 **State Name:** Palau **State Abbreviation:** PW **Region/Station Code:** 26

Survey Unit Code: 1 **Survey Unit Name**: Palau

County code and county name							
2	Aimeliik	100	Kayangel	218	Ngarchelong	227	Ngernmlengui
4	Airai	150	Koror	222	Ngardmau	228	Ngiwal
10	Angaur	212	Melekeok	224	Ngatpang	350	Peleliu
50	Hatoboheit	214	Ngaraard	226	Ngchesar	370	Sonsorol

State Code: 72[a] **State Name:** Puerto Rico **State Abbreviation:** PR **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: Mainland Puerto Rico

County code and county name							
1	Adjuntas	39	Ciales	77	Juncos	115	Quebradillas
3	Aguada	41	Cidra	79	Lajas	117	Rincón
5	Aguadilla	43	Coamo	81	Lares	119	Río Grande
7	Aguas Buenas	45	Comerío	83	Las Marías	121	Sabana Grande
9	Aibonito	47	Corozal	85	Las Piedras	123	Salinas
11	Añasco	51	Dorado	87	Loiza	125	San Germán
13	Arecibo	53	Fajardo	89	Luquillo	127	San Juan
15	Arroyo	54	Florida	91	Manatí	129	San Lorenzo
17	Barceloneta	55	Guánica	93	Maricao	131	San Sebastián
19	Barranquitas	57	Guayama	95	Maunabo	133	Santa Isabel
21	Bayamón	59	Guayanilla	97	Mayagüez[b]	135	Toa Alta
23	Cabo Rojo	61	Guaynabo	99	Moca	137	Toa Baja
25	Caguas	63	Gurabo	101	Morovis	139	Trujillo Alto
27	Camuy	65	Hatillo	103	Naguabo	141	Utuado
29	Canóvanas	67	Hormigueros	105	Naranjito	143	Vega Alta
31	Carolina	69	Humacao	107	Orocovis	145	Vega Baja
33	Cataño	71	Isabela Municipio	109	Patillas	149	Villalba
35	Cayey	73	Jayuya	111	Peñuelas	151	Yabucoa
37	Ceiba	75	Juana Díaz	113	Ponce	153	Yauco

Survey Unit Code: 2 **Survey Unit Name**: Vieques

County code and county name	
147	Vieques

Survey Unit Code: 3 **Survey Unit Name**: Culebra

County code and county name	
49	Culebra

[a]FIA estimates of Puerto Rico do not include the small outlying islands such as Desecheo, Caja de Muertos, etc.
[b]Mona Island is split from Mayagüez County (97) as a separate estimation unit for stratification. However, Mona Island is not a separate FIA survey unit because it is not a separate county (municipio); it is part of Mayagüez County.

State Code: 78 **State Name:** U.S. Virgin Islands **State Abbreviation:** VI **Region/Station Code:** 33

Survey Unit Code: 1 **Survey Unit Name**: St. Croix Island

County code and county name
10 St. Croix Island

Survey Unit Code: 2 **Survey Unit Name**: St. John Island

County code and county name
20 St. John Island

Survey Unit Code: 3 **Survey Unit Name**: St. Thomas Island

County code and county name
30 St. Thomas Island

Appendix C. Administrative National Forest Codes and Names

Region	Code	National Forest/Grassland/Area
Region 1	102	Beaverhead
Region 1	102	Beaverhead-Deerlodge [now combined]
Region 1	103	Bitterroot
Region 1	104	Idaho Panhandle
Region 1	105	Clearwater
Region 1	108	Custer
Region 1	109	Deerlodge
Region 1	110	Flathead
Region 1	111	Gallatin
Region 1	112	Helena
Region 1	114	Kootenai
Region 1	115	Lewis and Clark
Region 1	116	Lolo
Region 1	117	Nez Perce
Region 1	118	Dakota Prairie Grassland
Region 1	120	Cedar River NGL (National Grassland)
Region 1	121	Little Missouri NGL
Region 1	122	Sheyenne NGL
Region 1	124	Grand River NGL
Region 1	199	Other NFS Areas
Region 2	202	Bighorn
Region 2	203	Black Hills
Region 2	204	Grand Mesa-Uncompahgre-Gunnison
Region 2	206	Medicine Bow
Region 2	206	Medicine Bow-Routt [now combined]
Region 2	207	Nebraska
Region 2	209	Rio Grande
Region 2	210	Arapaho-Roosevelt
Region 2	211	Routt
Region 2	212	Pike and San Isabel
Region 2	213	San Juan
Region 2	214	Shoshone
Region 2	215	White River
Region 2	216	Samuel R Mckelvie
Region 2	217	Cimarron NGL
Region 2	218	Commanche NGL
Region 2	219	Pawnee NGL
Region 2	220	Oglala NGL
Region 2	221	Buffalo Gap NGL
Region 2	222	Fort Pierre NGL
Region 2	223	Thunder Basin NGL
Region 2	299	Other NFS Areas
Region 3	301	Apache-Sitgreaves
Region 3	302	Carson
Region 3	303	Cibola
Region 3	304	Coconino
Region 3	305	Coronado
Region 3	306	Gila
Region 3	307	Kaibab
Region 3	308	Lincoln
Region 3	309	Prescott
Region 3	310	Santa Fe
Region 3	312	Tonto
Region 3	399	Other NFS Areas

Region	Code	National Forest/Grassland/Area
Region 4	401	Ashley
Region 4	402	Boise
Region 4	403	Bridger-Teton
Region 4	405	Caribou
Region 4	406	Challis
Region 4	407	Dixie
Region 4	408	Fishlake
Region 4	409	Humboldt
Region 4	410	Manti-La Sal
Region 4	412	Payette
Region 4	413	Salmon
Region 4	413	Salmon-Challis [now combined]
Region 4	414	Sawtooth
Region 4	415	Targhee
Region 4	415	Caribou-Targhee [now combined]
Region 4	417	Toiyabe
Region 4	417	Humboldt-Toiyabe [now combined]
Region 4	418	Uinta
Region 4	419	Wasatch-Cache-Uinta [now combined]
Region 4	420	Desert Range Experiment Station
Region 4	499	Other NFS Areas
Region 5	501	Angeles
Region 5	502	Cleveland
Region 5	503	Eldorado
Region 5	504	Inyo
Region 5	505	Klamath
Region 5	506	Lassen
Region 5	507	Los Padres
Region 5	508	Mendocino
Region 5	509	Modoc
Region 5	510	Six Rivers
Region 5	511	Plumas
Region 5	512	San Bernardino
Region 5	513	Sequoia
Region 5	514	Shasta-Trinity
Region 5	515	Sierra
Region 5	516	Stanislaus
Region 5	517	Tahoe
Region 5	519	Lake Tahoe Basin
Region 5	599	Other NFS Areas
Region 6	601	Deschutes
Region 6	602	Fremont
Region 6	603	Gifford Pinchot
Region 6	604	Malheur
Region 6	605	Mt. Baker-Snoqualmie
Region 6	606	Mt. Hood
Region 6	607	Ochoco
Region 6	608	Okanogan
Region 6	609	Olympic
Region 6	610	Rogue River
Region 6	611	Siskiyou
Region 6	612	Siuslaw
Region 6	614	Umatilla
Region 6	615	Umpqua
Region 6	616	Wallowa-Whitman
Region 6	617	Wenatchee
Region 6	618	Willamette

Region	Code	National Forest/Grassland/Area
Region 6	620	Winema
Region 6	621	Colville
Region 6	622	Columbia River Gorge NSA
Region 6	650	Crooked River National Grassland
Region 6	699	Other NFS Areas
Region 8	801	NFS in Alabama
Region 8	802	Daniel Boone
Region 8	803	Chattahoochee-Oconee
Region 8	804	Cherokee
Region 8	805	NFS in Florida
Region 8	806	Kisatchie
Region 8	807	NFS in Mississippi
Region 8	808	George Washington
Region 8	809	Ouachita
Region 8	810	Ozark and St. Francis
Region 8	811	NFS in North Carolina
Region 8	812	Francis Marion-Sumter
Region 8	813	NFS in Texas
Region 8	814	Jefferson
Region 8	816	El Yunque
Region 8	836	Savannah River Site
Region 8	860	Land Between the Lakes
Region 8	899	Other NFS areas
Region 9	902	Chequamegon
Region 9	903	Chippewa
Region 9	904	Huron-Manistee
Region 9	905	Mark Twain
Region 9	906	Nicolet
Region 9	907	Ottawa
Region 9	908	Shawnee
Region 9	909	Superior
Region 9	910	Hiawatha
Region 9	912	Hoosier
Region 9	913	Chequamegon-Nicolet
Region 9	914	Wayne
Region 9	915	Midewin Tallgrass Prairie
Region 9	918	Wayne
Region 9	919	Allegheny
Region 9	920	Green Mountain
Region 9	921	Monongahela
Region 9	922	White Mountain
Region 9	999	Other NFS areas
Region 10	1004	Chugach
Region 10	1005	Tongass
Region 10	1099	Other NFS Areas
For Any Region	9999	Other Forest Service

Appendix D. Forest Type Codes and Names

Note: The forest type names used by FIA do not come from a single published reference. The current list of forest type names has been developed over time using sources such as historical FIA lists, lists from the Society of American Foresters, and FIA analysts who developed names to meet current analysis and reporting needs.

Code	Forest type / type group
100	**White / red / jack pine group**
101	Jack pine
102	Red pine
103	Eastern white pine
104	Eastern white pine / eastern hemlock
105	Eastern hemlock
120	**Spruce / fir group**
121	Balsam fir
122	White spruce
123	Red spruce
124	Red spruce / balsam fir
125	Black spruce
126	Tamarack
127	Northern white-cedar
128	Fraser fir
129	Red spruce / Fraser fir
140	**Longleaf / slash pine group**
141	Longleaf pine
142	Slash pine
150	**Tropical softwoods group**
151	Tropical pines
160	**Loblolly / shortleaf pine group**
161	Loblolly pine
162	Shortleaf pine
163	Virginia pine
164	Sand pine
165	Table mountain pine
166	Pond pine
167	Pitch pine
168	Spruce pine
170	**Other eastern softwoods group**
171	Eastern redcedar
172	Florida softwoods
180	**Pinyon / juniper group**
182	Rocky Mountain juniper
184	Juniper woodland
185	Pinyon / juniper woodland
200	**Douglas-fir group**
201	Douglas-fir

Code	Forest type / type group
202	Port-Orford-cedar
203	Bigcone Douglas-fir
220	**Ponderosa pine group**
221	Ponderosa pine
222	Incense-cedar
224	Sugar pine
225	Jeffrey pine
226	Coulter pine
240	**Western white pine group**
241	Western white pine
260	**Fir / spruce / mountain hemlock group**
261	White fir
262	Red fir
263	Noble fir
264	Pacific silver fir
265	Engelmann spruce
266	Engelmann spruce / subalpine fir
267	Grand fir
268	Subalpine fir
269	Blue spruce
270	Mountain hemlock
271	Alaska-yellow-cedar
280	**Lodgepole pine group**
281	Lodgepole pine
300	**Hemlock / Sitka spruce group**
301	Western hemlock
304	Western redcedar
305	Sitka spruce
320	**Western larch group**
321	Western larch
340	**Redwood group**
341	Redwood
342	Giant sequoia
360	**Other western softwoods group**
361	Knobcone pine
362	Southwestern white pine
363	Bishop pine
364	Monterey pine
365	Foxtail pine / bristlecone pine
366	Limber pine
367	Whitebark pine
368	Miscellaneous western softwoods
369	Western juniper
370	**California mixed conifer group**
371	California mixed conifer

Code	Forest type / type group
380	**Exotic softwoods group**
381	Scotch pine
383	Other exotic softwoods
384	Norway spruce
385	Introduced larch
390	**Other softwoods group**
391	Other softwoods
400	**Oak / pine group**
401	Eastern white pine / northern red oak / white ash
402	Eastern redcedar / hardwood
403	Longleaf pine / oak
404	Shortleaf pine / oak
405	Virginia pine / southern red oak
406	Loblolly pine / hardwood
407	Slash pine / hardwood
409	Other pine / hardwood
500	**Oak / hickory group**
501	Post oak / blackjack oak
502	Chestnut oak
503	White oak / red oak / hickory
504	White oak
505	Northern red oak
506	Yellow-poplar / white oak / northern red oak
507	Sassafras / persimmon
508	Sweetgum / yellow-poplar
509	Bur oak
510	Scarlet oak
511	Yellow-poplar
512	Black walnut
513	Black locust
514	Southern scrub oak
515	Chestnut oak / black oak / scarlet oak
516	Cherry / white ash / yellow-poplar
517	Elm / ash / black locust
519	Red maple / oak
520	Mixed upland hardwoods
600	**Oak / gum / cypress group**
601	Swamp chestnut oak / cherrybark oak
602	Sweetgum / Nuttall oak / willow oak
605	Overcup oak / water hickory
606	Atlantic white-cedar
607	Baldcypress / water tupelo
608	Sweetbay / swamp tupelo / red maple
609	Baldcypress / pondcypress
700	**Elm / ash / cottonwood group**
701	Black ash / American elm / red maple
702	River birch / sycamore
703	Cottonwood

Code	Forest type / type group
704	Willow
705	Sycamore / pecan / American elm
706	Sugarberry / hackberry / elm / green ash
707	Silver maple / American elm
708	Red maple / lowland
709	Cottonwood / willow
722	Oregon ash
800	**Maple / beech / birch group**
801	Sugar maple / beech / yellow birch
802	Black cherry
805	Hard maple / basswood
809	Red maple / upland
900	**Aspen / birch group**
901	Aspen
902	Paper birch
903	Gray birch
904	Balsam poplar
905	Pin cherry
910	**Alder / maple group**
911	Red alder
912	Bigleaf maple
920	**Western oak group**
921	Gray pine
922	California black oak
923	Oregon white oak
924	Blue oak
931	Coast live oak
933	Canyon live oak
934	Interior live oak
935	California white oak (valley oak)
940	**Tanoak / laurel group**
941	Tanoak
942	California laurel
943	Giant chinkapin
960	**Other hardwoods group**
961	Pacific madrone
962	Other hardwoods
970	**Woodland hardwoods group**
971	Deciduous oak woodland
972	Evergreen oak woodland
973	Mesquite woodland
974	Cercocarpus (mountain brush) woodland
975	Intermountain maple woodland
976	Miscellaneous woodland hardwoods
980	**Tropical hardwoods group**

Code	Forest type / type group
982	Mangrove
983	Palms
984	Dry forest
985	Moist forest
986	Wet and rain forest
987	Lower montane wet and rain forest
989	Other tropical hardwoods
990	**Exotic hardwoods group**
991	Paulownia
992	Melaleuca
993	Eucalyptus
995	Other exotic hardwoods
999	Nonstocked

Appendix E. Tree Species Group Codes

Species group name	Code
Softwood species groups	
Eastern softwood species groups	
Longleaf and slash pines	1
Loblolly and shortleaf pines	2
Other yellow pines	3
Eastern white and red pines	4
Jack pine	5
Spruce and balsam fir	6
Eastern hemlock	7
Cypress	8
Other eastern softwoods	9
Western softwood species groups	
Douglas-fir	10
Ponderosa and Jeffrey pines	11
True fir	12
Western hemlock	13
Sugar pine	14
Western white pine	15
Redwood	16
Sitka spruce	17
Engelmann and other spruces	18
Western larch	19
Incense-cedar	20
Lodgepole pine	21
Western redcedar	22
Woodland softwoods	23
Other western softwoods	24
Hardwood species groups	
Eastern hardwood species groups	
Select white oaks	25
Select red oaks	26
Other white oaks	27
Other red oaks	28
Hickory	29
Yellow birch	30
Hard maple	31
Soft maple	32
Beech	33
Sweetgum	34
Tupelo and blackgum	35
Ash	36
Cottonwood and aspen	37
Basswood	38
Yellow-poplar	39
Black walnut	40
Other eastern soft hardwoods	41
Other eastern hard hardwoods	42
Eastern noncommercial hardwoods	43
Western hardwood species groups	
Cottonwood and aspen	44
Red alder	45
Oak	46
Other western hardwoods	47

Species group name	Code
Woodland hardwoods	48
Tropical and subtropical species groups	
Tropical and subtropical pines	51
Other tropical and subtropical softwoods	52
Tropical and subtropical palms	53
Tropical and subtropical hardwoods	54

Appendix F. Tree Species Codes, Names, and Occurrences

Major groups (MAJGRP) are (1) pines, (2) other softwoods, (3) soft hardwoods, and (4) hard hardwoods. The 48 species groups (SPGRPCD) can be found in appendix E. The FIA work units listed are NC – (former) North Central, NE – (former) Northeastern, PNW – Pacific Northwest, RM – Rocky Mountain, and SO – Southern.

						Occurrence by FIA work unit				
SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	NC	NE	PNW	RM	SO
			East	West						
10	fir spp.	*Abies* spp.	6	12	2	X	X			X
11	Pacific silver fir	*Abies amabilis*	9	12	2			X		
12	balsam fir	*Abies balsamea*	6	12	2	X	X			X
14	Santa Lucia or bristlecone fir	*Abies bracteata*	9	12	2			X		
15	white fir	*Abies concolor*	9	12	2	X		X	X	X
16	Fraser fir	*Abies fraseri*	9	12	2	X	X			X
17	grand fir	*Abies grandis*	9	12	2			X	X	
18	corkbark fir	*Abies lasiocarpa* var. *arizonica*	9	12	2				X	X
19	subalpine fir	*Abies lasiocarpa*	9	12	2			X	X	X
20	California red fir	*Abies magnifica*	9	12	2			X	X	
21	Shasta red fir	*Abies shastensis*	9	12	2			X	X	
22	noble fir	*Abies procera*	9	12	2			X	X	
40	white-cedar spp.	*Chamaecyparis* spp.	9	24	2		X	X		
41	Port-Orford-cedar	*Chamaecyparis lawsoniana*	9	24	2			X		
42	Alaska yellow-cedar	*Chamaecyparis nootkatensis*	9	24	2			X		
43	Atlantic white-cedar	*Chamaecyparis thyoides*	9	24	2		X			X
50	cypress	*Cupressus* spp.	9	24	2			X		
51	Arizona cypress	*Cupressus arizonica*	9	24	2			X	X	X
52	Baker or Modoc cypress	*Cupressus bakeri*	9	24	2			X		
53	Tecate cypress	*Cupressus forbesii*	9	24	2			X		
54	Monterey cypress	*Cupressus macrocarpa*	9	24	2			X		
55	Sargent's cypress	*Cupressus sargentii*	9	24	2			X		
56	MacNab's cypress	*Cupressus macnabiana*	9	24	2			X		
57	redcedar/juniper spp.	*Juniperus* spp.	9	23	2	X	X			X
58	Pinchot juniper	*Juniperus pinchotii*	23	23	2				X	X
59	redberry juniper	*Juniperus coahuilensis*	23	23	2				X	X
60	drooping juniper	*Juniperus flaccida*	23	23	2					X
61	Ashe juniper	*Juniperus ashei*	23	23	2	X				X
62	California juniper	*Juniperus californica*	23	23	2			X	X	
63	alligator juniper	*Juniperus deppeana*	23	23	2				X	X
64	western juniper	*Juniperus occidentalis*	9	24	2			X	X	
65	Utah juniper	*Juniperus osteosperma*	23	23	2			X	X	X
66	Rocky Mountain juniper	*Juniperus scopulorum*	23	23	2	X		X	X	X
67	southern redcedar	*Juniperus virginiana* var. *silicicola*	9	24	2					X
68	eastern redcedar	*Juniperus virginiana*	9	24	2	X	X		X	X
69	oneseed juniper	*Juniperus monosperma*	23	23	2				X	X
70	larch spp.	*Larix* spp.	9	24	2	X	X			
71	tamarack (native)	*Larix laricina*	9	24	2	X	X	X		
72	subalpine larch	*Larix lyallii*	9	24	2			X	X	
73	western larch	*Larix occidentalis*	9	19	2			X	X	
81	incense-cedar	*Calocedrus decurrens*	9	20	2			X	X	
90	spruce spp.	*Picea* spp.	6	18	2	X	X			X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
91	Norway spruce	*Picea abies*	9	18	2	X	X			X
92	Brewer spruce	*Picea breweriana*	9	18	2			X		
93	Engelmann spruce	*Picea engelmannii*	9	18	2	X		X	X	X
94	white spruce	*Picea glauca*	6	18	2	X	X	X	X	X
95	black spruce	*Picea mariana*	6	18	2	X	X	X		X
96	blue spruce	*Picea pungens*	9	18	2	X	X		X	X
97	red spruce	*Picea rubens*	6	18	2		X			X
98	Sitka spruce	*Picea sitchensis*	9	17	2			X		
100	pine spp.	*Pinus* spp.	9	24	1	X	X	X		X
101	whitebark pine	*Pinus albicaulis*	9	24	1			X	X	
102	Rocky Mountain bristlecone pine	*Pinus aristata*	9	24	1			X	X	X
103	knobcone pine	*Pinus attenuata*	9	24	1			X	X	
104	foxtail pine	*Pinus balfouriana*	9	24	1			X	X	
105	jack pine	*Pinus banksiana*	5	24	1	X	X			
106	common or two-needle pinyon	*Pinus edulis*	23	23	1			X	X	X
107	sand pine	*Pinus clausa*	3	24	1					X
108	lodgepole pine	*Pinus contorta*	9	21	1	X		X	X	
109	Coulter pine	*Pinus coulteri*	9	24	1			X		
110	shortleaf pine	*Pinus echinata*	2	24	1	X	X			X
111	slash pine	*Pinus elliottii*	1	24	1					X
112	Apache pine	*Pinus engelmannii*	9	24	1				X	
113	limber pine	*Pinus flexilis*	9	24	1	X		X	X	X
114	southwestern white pine	*Pinus strobiformis*	9	24	1				X	X
115	spruce pine	*Pinus glabra*	3	24	1					X
116	Jeffrey pine	*Pinus jeffreyi*	9	11	1			X	X	
117	sugar pine	*Pinus lambertiana*	9	14	1			X	X	
118	Chihuahuan pine	*Pinus leiophylla*	9	24	1				X	X
119	western white pine	*Pinus monticola*	9	15	1			X	X	
120	bishop pine	*Pinus muricata*	9	24	1			X		
121	longleaf pine	*Pinus palustris*	1	24	1					X
122	ponderosa pine	*Pinus ponderosa*	9	11	1	X		X	X	X
123	Table Mountain pine	*Pinus pungens*	3	24	1		X			X
124	Monterey pine	*Pinus radiata*	9	24	1			X		
125	red pine	*Pinus resinosa*	4	24	1	X	X			X
126	pitch pine	*Pinus rigida*	3	24	1		X			X
127	gray or California foothill pine	*Pinus sabiniana*	9	24	1			X		
128	pond pine	*Pinus serotina*	3	24	1		X			X
129	eastern white pine	*Pinus strobus*	4	24	1	X	X			X
130	Scotch pine	*Pinus sylvestris*	3	24	1	X	X	X	X	X
131	loblolly pine	*Pinus taeda*	2	24	1	X	X			X
132	Virginia pine	*Pinus virginiana*	3	24	1	X	X			X
133	singleleaf pinyon	*Pinus monophylla*	23	23	1			X	X	X
134	border pinyon	*Pinus discolor*	23	23	1				X	X
135	Arizona pine	*Pinus arizonica*	9	11	1				X	X
136	Austrian pine	*Pinus nigra*	9	24	1	X	X		X	X
137	Washoe pine	*Pinus washoensis*	9	24	1			X	X	

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
138	four-leaf or Parry pinyon pine	*Pinus quadrifolia*	23	23	1			X		
139	Torrey pine	*Pinus torreyana*	9	24	1			X		
140	Mexican pinyon pine	*Pinus cembroides*	23	23	1				X	X
141	papershell pinyon pine	*Pinus remota*	23	23	1					X
142	Great Basin bristlecone pine	*Pinus longaeva*	9	24	1			X	X	
143	Arizona pinyon pine	*Pinus monophylla* var. *fallax*	23	23	1				X	X
144	Honduras pine	*Pinus elliottii* var. *elliottii*	9	24	1					X
200	Douglas-fir spp.	*Pseudotsuga* spp.	9	10	2	X		X		
201	bigcone Douglas-fir	*Pseudotsuga macrocarpa*	9	10	2			X		
202	Douglas-fir	*Pseudotsuga menziesii*	9	10	2	X	X	X	X	X
211	redwood	*Sequoia sempervirens*	9	16	2			X		
212	giant sequoia	*Sequoiadendron giganteum*	9	24	2			X		
220	baldcypress spp.	*Taxodium* spp.	9	24	2	X	X			X
221	baldcypress	*Taxodium distichum*	8	24	2	X	X			X
222	pondcypress	*Taxodium ascendens*	8	24	2		X			X
223	Montezuma baldcypress	*Taxodium mucronatum*	8	24	2					X
230	yew spp.	*Taxus* spp.	9	24	2	X		X		
231	Pacific yew	*Taxus brevifolia*	9	24	2			X	X	
232	Florida yew	*Taxus floridana*	9	24	2					X
240	thuja spp.	*Thuja* spp.	9	24	2	X		X		
241	northern white-cedar	*Thuja occidentalis*	9	24	2	X	X			X
242	western redcedar	*Thuja plicata*	9	22	2			X	X	
250	torreya (nutmeg) spp.	*Torreya* spp.	9	24	2			X		
251	California torreya (nutmeg)	*Torreya californica*	9	24	2			X		
252	Florida torreya (nutmeg)	*Torreya taxifolia*	9	24	2					X
260	hemlock spp.	*Tsuga* spp.	7	24	2	X	X			X
261	eastern hemlock	*Tsuga canadensis*	7	24	2	X	X			X
262	Carolina hemlock	*Tsuga caroliniana*	7	24	2					X
263	western hemlock	*Tsuga heterophylla*	9	13	2			X	X	
264	mountain hemlock	*Tsuga mertensiana*	9	24	2			X	X	
299	Unknown dead conifer	Tree evergreen	9	24	2	X	X	X		X
300	acacia spp.	*Acacia* spp.	48	48	3			X		
303	sweet acacia	*Acacia farnesiana*	48	48	3					X
304	catclaw acacia	*Acacia greggii*	48	48	3			X		X
310	maple spp.	*Acer* spp.	31	47	4	X	X			X
311	Florida maple	*Acer barbatum*	31	47	4					X
312	bigleaf maple	*Acer macrophyllum*	43	47	3			X		X
313	boxelder	*Acer negundo*	41	47	3	X	X	X	X	X
314	black maple	*Acer nigrum*	31	47	4	X	X			X
315	striped maple	*Acer pensylvanicum*	43	47	3	X	X			X
316	red maple	*Acer rubrum*	32	47	3	X	X			X
317	silver maple	*Acer saccharinum*	32	47	3	X	X			X
318	sugar maple	*Acer saccharum*	31	47	4	X	X			X
319	mountain maple	*Acer spicatum*	43	47	4	X	X			X
320	Norway maple	*Acer platanoides*	31	47	4	X	X	X		X
321	Rocky Mountain maple	*Acer glabrum*	48	48	4	X		X		X
322	bigtooth maple	*Acer grandidentatum*	48	48	4			X	X	X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
323	chalk maple	*Acer leucoderme*	31	47	4					X
330	buckeye, horsechestnut spp.	*Aesculus* spp.	41	47	3	X	X	X		X
331	Ohio buckeye	*Aesculus glabra*	41	47	3	X	X			X
332	yellow buckeye	*Aesculus flava*	43	47	3	X	X			X
333	California buckeye	*Aesculus californica*	41	47	3			X		
334	Texas buckeye	*Aesculus glabra* var. *arguta*	41	47	3	X				X
336	red buckeye	*Aesculus pavia*	43	47	3	X	X			X
337	painted buckeye	*Aesculus sylvatica*	41	47	3					X
341	ailanthus	*Ailanthus altissima*	43	47	4	X	X	X		X
345	mimosa, silktree	*Albizia julibrissin*	43	47	3	X	X			X
350	alder spp.	*Alnus* spp.	41	47	3	X		X		X
351	red alder	*Alnus rubra*	43	45	3			X	X	X
352	white alder	*Alnus rhombifolia*	43	47	3			X	X	
353	Arizona alder	*Alnus oblongifolia*	43	47	3			X	X	X
355	European alder	*Alnus glutinosa*	43	47	3	X	X			X
356	serviceberry spp.	*Amelanchier* spp.	43	47	4	X	X			X
357	common serviceberry	*Amelanchier arborea*	43	47	4	X	X			
358	roundleaf serviceberry	*Amelanchier sanguinea*	43	47	4	X	X			
360	madrone spp.	*Arbutus* spp.	43	47	4			X		X
361	Pacific madrone	*Arbutus menziesii*	43	47	4			X	X	
362	Arizona madrone	*Arbutus arizonica*	43	47	4			X	X	X
363	Texas madrone	*Arbutus xalapensis*	48	48	4					X
367	pawpaw	*Asimina triloba*	43	47	3	X	X			X
370	birch spp.	*Betula* spp.	41	47	4	X	X			X
371	yellow birch	*Betula alleghaniensis*	30	47	4	X	X			X
372	sweet birch	*Betula lenta*	42	47	4	X	X			X
373	river birch	*Betula nigra*	41	47	3	X	X			X
374	water birch	*Betula occidentalis*	41	47	3	X		X	X	X
375	paper birch	*Betula papyrifera*	41	47	3	X	X	X	X	X
377	Virginia roundleaf birch	*Betula uber*	41	47	3					X
378	northwestern paper birch	*Betula x utahensis*	43	47	3			X		
379	gray birch	*Betula populifolia*	41	47	3	X	X			X
381	chittamwood, gum bumelia	*Sideroxylon lanuginosum* ssp. *lanuginosum*	43	47	4	X				X
391	American hornbeam, musclewood	*Carpinus caroliniana*	43	47	4	X	X			X
400	hickory spp.	*Carya* spp.	29	47	4	X	X			X
401	water hickory	*Carya aquatica*	29	47	4	X				X
402	bitternut hickory	*Carya cordiformis*	29	47	4	X	X			X
403	pignut hickory	*Carya glabra*	29	47	4	X	X			X
404	pecan	*Carya illinoinensis*	29	47	4	X	X		X	X
405	shellbark hickory	*Carya laciniosa*	29	47	4	X	X			X
406	nutmeg hickory	*Carya myristiciformis*	29	47	4					X
407	shagbark hickory	*Carya ovata*	29	47	4	X	X			X
408	black hickory	*Carya texana*	29	47	4	X				X
409	mockernut hickory	*Carya alba*	29	47	4	X	X			X
410	sand hickory	*Carya pallida*	29	47	4	X	X			X
411	scrub hickory	*Carya floridana*	29	47	4					X
412	red hickory	*Carya ovalis*	29	47	4	X	X			X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
413	southern shagbark hickory	*Carya carolinae-septentrionalis*	29	47	4					X
420	chestnut spp.	*Castanea* spp.	43	47	3	X	X			X
421	American chestnut	*Castanea dentata*	43	47	3	X	X			X
422	Allegheny chinkapin	*Castanea pumila*	43	47	3	X	X			X
423	Ozark chinkapin	*Castanea pumila* var. *ozarkensis*	43	47	3	X				X
424	Chinese chestnut	*Castanea mollissima*	43	47	3	X	X			X
431	giant chinkapin, golden chinkapin	*Chrysolepis chrysophylla* var. *chrysophylla*	43	47	3			X		
450	catalpa spp.	*Catalpa* spp.	42	47	4	X	X			X
451	southern catalpa	*Catalpa bignonioides*	43	47	4	X				X
452	northern catalpa	*Catalpa speciosa*	41	47	3	X	X			X
460	hackberry spp.	*Celtis* spp.	41	47	3	X	X			X
461	sugarberry	*Celtis laevigata*	41	47	3	X	X		X	X
462	hackberry	*Celtis occidentalis*	41	47	3	X	X		X	X
463	netleaf hackberry	*Celtis laevigata* var. *reticulata*	41	47	3	X				X
471	eastern redbud	*Cercis canadensis*	43	47	3	X	X			X
475	curlleaf mountain-mahogany	*Cercocarpus ledifolius*	48	48	4			X	X	X
481	yellowwood	*Cladrastis kentukea*	43	47	4	X	X			X
490	dogwood spp.	*Cornus* spp.	43	47	4	X	X	X		
491	flowering dogwood	*Cornus florida*	42	47	4	X	X			X
492	Pacific dogwood	*Cornus nuttallii*	43	47	4			X	X	X
500	hawthorn spp.	*Crataegus* spp.	43	47	4	X	X	X		X
501	cockspur hawthorn	*Crataegus crus-galli*	43	47	4	X	X			X
502	downy hawthorn	*Crataegus mollis*	43	47	4	X	X			X
503	Brainerd's hawthorn	*Crataegus brainerdii*	43	47	4	X	X			X
504	pear hawthorn	*Crataegus calpodendron*	43	47	4	X	X			X
505	fireberry hawthorn	*Crataegus chrysocarpa*	43	47	4	X	X			X
506	broadleaf hawthorn	*Crataegus dilatata*	43	47	4	X	X			X
507	fanleaf hawthorn	*Crataegus flabellata*	43	47	4	X	X			X
508	oneseed hawthorn	*Crataegus monogyna*	43	47	4	X	X			X
509	scarlet hawthorn	*Crataegus pedicellata*	43	47	4	X	X			X
510	eucalyptus spp.	*Eucalyptus* spp.	42	47	4			X		X
511	Tasmanian bluegum	*Eucalyptus globulus*	43	47	4			X		
512	river redgum	*Eucalyptus camaldulensis*	43	47	4			X		
513	grand eucalyptus	*Eucalyptus grandis*	43	47	4			X		X
514	swampmahogany	*Eucalyptus robusta*	43	47	4					X
520	persimmon spp.	*Diospyros* spp.	43	47	4	X	X			X
521	common persimmon	*Diospyros virginiana*	42	47	4	X	X			X
522	Texas persimmon	*Diospyros texana*	43	47	4					X
523	Anacua knockaway	*Ehretia anacua*	48	48	3					X
531	American beech	*Fagus grandifolia*	33	47	4	X	X			X
540	ash spp.	*Fraxinus* spp.	36	47	3	X	X	X		X
541	white ash	*Fraxinus americana*	36	47	4	X	X			X
542	Oregon ash	*Fraxinus latifolia*	43	47	4			X		
543	black ash	*Fraxinus nigra*	36	47	3	X	X			X
544	green ash	*Fraxinus pennsylvanica*	36	47	4	X	X		X	X
545	pumpkin ash	*Fraxinus profunda*	36	47	3	X	X			X
546	blue ash	*Fraxinus quadrangulata*	36	47	4	X	X			X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
547	velvet ash	*Fraxinus velutina*	43	47	4			X	X	X
548	Carolina ash	*Fraxinus caroliniana*	36	47	4					X
549	Texas ash	*Fraxinus texensis*	36	47	3					X
550	honeylocust spp.	*Gleditsia* spp.	42	47	4	X	X	X		X
551	waterlocust	*Gleditsia aquatica*	42	47	4	X				X
552	honeylocust	*Gleditsia triacanthos*	42	47	4	X	X		X	X
555	loblolly-bay	*Gordonia lasianthus*	41	47	3					X
561	ginkgo, maidenhair tree	*Ginkgo biloba*	43	47	3	X	X	X		X
571	Kentucky coffeetree	*Gymnocladus dioicus*	42	47	4	X	X			X
580	silverbell spp.	*Halesia* spp.	43	47	3	X	X			X
581	Carolina silverbell	*Halesia carolina*	41	47	3					X
582	two-wing silverbell	*Halesia diptera*	41	47	3					X
583	little silverbell	*Halesia parviflora*	41	47	3					X
591	American holly	*Ilex opaca*	42	47	4	X	X	X		X
600	walnut spp.	*Juglans* spp.	41	47	4	X	X	X		X
601	butternut	*Juglans cinerea*	41	47	3	X	X			X
602	black walnut	*Juglans nigra*	40	47	4	X	X	X	X	X
603	northern California black walnut	*Juglans hindsii*	43	47	4			X		
604	southern California black walnut	*Juglans californica*	43	47	4			X		
605	Texas walnut	*Juglans microcarpa*	41	47	4	X				X
606	Arizona walnut	*Juglans major*	43	47	4			X	X	X
611	sweetgum	*Liquidambar styraciflua*	34	47	3	X	X	X		X
621	yellow-poplar	*Liriodendron tulipifera*	39	47	3	X	X			X
631	tanoak	*Lithocarpus densiflorus*	43	47	4			X		
641	Osage-orange	*Maclura pomifera*	43	47	4	X	X			X
650	magnolia spp.	*Magnolia* spp.	41	47	3	X	X			X
651	cucumbertree	*Magnolia acuminata*	41	47	3	X	X			X
652	southern magnolia	*Magnolia grandiflora*	41	47	3		X			X
653	sweetbay	*Magnolia virginiana*	43	47	3		X			X
654	bigleaf magnolia	*Magnolia macrophylla*	43	47	4		X			X
655	mountain or Fraser magnolia	*Magnolia fraseri*	41	47	3		X			X
657	pyramid magnolia	*Magnolia pyramidata*	41	47	3					X
658	umbrella magnolia	*Magnolia tripetala*	41	47	3	X	X			X
660	apple spp.	*Malus* spp.	43	47	4	X	X	X		X
661	Oregon crab apple	*Malus fusca*	43	47	4			X		
662	southern crab apple	*Malus angustifolia*	43	47	4	X	X			X
663	sweet crab apple	*Malus coronaria*	43	47	4	X	X			X
664	prairie crab apple	*Malus ioensis*	43	47	4	X				X
680	mulberry spp.	*Morus* spp.	42	47	4	X	X			X
681	white mulberry	*Morus alba*	42	47	4	X	X			X
682	red mulberry	*Morus rubra*	42	47	4	X	X			X
683	Texas mulberry	*Morus microphylla*	42	47	4					X
684	black mulberry	*Morus nigra*	43	47	4		X			X
690	tupelo spp.	*Nyssa* spp.	35	47	3	X	X			X
691	water tupelo	*Nyssa aquatica*	35	47	3	X				X
692	Ogeechee tupelo	*Nyssa ogeche*	43	47	4					X
693	blackgum	*Nyssa sylvatica*	35	47	3	X	X			X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
694	swamp tupelo	*Nyssa biflora*	35	47	3	X	X			X
701	eastern hophornbeam	*Ostrya virginiana*	43	47	4	X	X			X
711	sourwood	*Oxydendrum arboreum*	43	47	4	X	X			X
712	paulownia, empress-tree	*Paulownia tomentosa*	41	47	3	X	X			X
720	bay spp.	*Persea* spp.	43	47	3		X			X
721	redbay	*Persea borbonia*	41	47	3					X
722	water-elm, planertree	*Planera aquatica*	43	47	3	X				X
729	sycamore spp.	*Platanus* spp.	41	47	3	X	X	X		X
730	California sycamore	*Platanus racemosa*	43	47	3			X		
731	American sycamore	*Platanus occidentalis*	41	47	3	X	X	X		X
732	Arizona sycamore	*Platanus wrightii*	41	47	3			X	X	X
740	cottonwood and poplar spp.	*Populus* spp.	37	44	3	X	X			X
741	balsam poplar	*Populus balsamifera*	37	44	3	X	X		X	X
742	eastern cottonwood	*Populus deltoides*	37	44	3	X	X		X	X
743	bigtooth aspen	*Populus grandidentata*	37	44	3	X	X			X
744	swamp cottonwood	*Populus heterophylla*	37	44	3	X	X			X
745	plains cottonwood	*Populus deltoides* ssp. *monilifera*	37	44	3	X			X	X
746	quaking aspen	*Populus tremuloides*	37	44	3	X	X	X	X	X
747	black cottonwood	*Populus balsamifera* ssp. *trichocarpa*	37	44	4	X		X	X	
748	Fremont cottonwood	*Populus fremontii*	37	44	4			X	X	X
749	narrowleaf cottonwood	*Populus angustifolia*	37	44	3	X			X	X
752	silver poplar	*Populus alba*	37	44	3	X	X			X
753	Lombardy poplar	*Populus nigra*	37	44	3	X	X	X		X
755	mesquite spp.	*Prosopis* spp.	48	48	4					X
756	honey mesquite	*Prosopis glandulosa*	48	48	4			X	X	X
757	velvet mesquite	*Prosopis velutina*	48	48	4			X	X	X
758	screwbean mesquite	*Prosopis pubescens*	48	48	4			X	X	X
760	cherry and plum spp.	*Prunus* spp.	43	47	4	X	X	X		X
761	pin cherry	*Prunus pensylvanica*	43	47	3	X	X			X
762	black cherry	*Prunus serotina*	41	47	3	X	X			X
763	chokecherry	*Prunus virginiana*	43	47	4	X	X	X		X
764	peach	*Prunus persica*	43	47	3	X	X			X
765	Canada plum	*Prunus nigra*	43	47	4	X	X			X
766	American plum	*Prunus americana*	43	47	4	X	X			X
768	bitter cherry	*Prunus emarginata*	43	47	4			X		
769	Allegheny plum	*Prunus alleghaniensis*	43	47	3	X	X			X
770	Chickasaw plum	*Prunus angustifolia*	43	47	3	X	X			X
771	sweet cherry, domesticated	*Prunus avium*	43	47	3	X	X	X		X
772	sour cherry, domesticated	*Prunus cerasus*	43	47	3	X	X	X		
773	European plum, domesticated	*Prunus domestica*	43	47	3	X	X	X		
774	Mahaleb cherry, domesticated	*Prunus mahaleb*	43	47	3	X	X	X		
800	oak spp.	*Quercus* spp.	42	48	4	X	X	X		X
801	California live oak	*Quercus agrifolia*	43	46	4			X		
802	white oak	*Quercus alba*	25	47	4	X	X			X
803	Arizona white oak	*Quercus arizonica*	48	48	4				X	X
804	swamp white oak	*Quercus bicolor*	25	47	4	X	X			X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
805	canyon live oak	*Quercus chrysolepis*	43	46	4			X		
806	scarlet oak	*Quercus coccinea*	28	47	4	X	X			X
807	blue oak	*Quercus douglasii*	43	46	4			X		
808	Durand oak	*Quercus sinuata* var. *sinuata*	25	47	4					X
809	northern pin oak	*Quercus ellipsoidalis*	28	47	4	X	X			X
810	Emory oak	*Quercus emoryi*	48	48	4				X	X
811	Engelmann oak	*Quercus engelmannii*	43	46	4			X		
812	southern red oak	*Quercus falcata*	28	47	4	X	X			X
813	cherrybark oak	*Quercus pagoda*	26	47	4	X	X			X
814	Gambel oak	*Quercus gambelii*	48	48	4				X	X
815	Oregon white oak	*Quercus garryana*	43	46	4			X		
816	scrub oak	*Quercus ilicifolia*	43	47	4		X			X
817	shingle oak	*Quercus imbricaria*	28	47	4	X	X			X
818	California black oak	*Quercus kelloggii*	43	46	4			X		
819	turkey oak	*Quercus laevis*	43	47	4					X
820	laurel oak	*Quercus laurifolia*	28	47	4		X			X
821	California white oak	*Quercus lobata*	43	46	4			X		
822	overcup oak	*Quercus lyrata*	27	47	4	X	X			X
823	bur oak	*Quercus macrocarpa*	25	47	4	X	X		X	X
824	blackjack oak	*Quercus marilandica*	28	47	4	X	X			X
825	swamp chestnut oak	*Quercus michauxii*	25	47	4	X	X			X
826	chinkapin oak	*Quercus muehlenbergii*	25	47	4	X	X	X	X	X
827	water oak	*Quercus nigra*	28	47	4	X	X			X
828	Texas red oak	*Quercus texana*	28	47	4	X				X
829	Mexican blue oak	*Quercus oblongifolia*	48	48	4				X	X
830	pin oak	*Quercus palustris*	28	47	4	X	X			X
831	willow oak	*Quercus phellos*	28	47	4	X	X			X
832	chestnut oak	*Quercus prinus*	27	47	4	X	X			X
833	northern red oak	*Quercus rubra*	26	47	4	X	X			X
834	Shumard oak	*Quercus shumardii*	26	47	4	X	X			X
835	post oak	*Quercus stellata*	27	47	4	X	X			X
836	Delta post oak	*Quercus similis*	27	47	4					X
837	black oak	*Quercus velutina*	28	47	4	X	X			X
838	live oak	*Quercus virginiana*	27	47	4					X
839	interior live oak	*Quercus wislizeni*	43	46	4			X		
840	dwarf post oak	*Quercus margarettiae*	27	47	4	X				X
841	dwarf live oak	*Quercus minima*	27	47	4					X
842	bluejack oak	*Quercus incana*	43	47	4					X
843	silverleaf oak	*Quercus hypoleucoides*	48	48	4				X	X
844	Oglethorpe oak	*Quercus oglethorpensis*	27	47	4					X
845	dwarf chinkapin oak	*Quercus prinoides*	43	47	4	X	X			X
846	gray oak	*Quercus grisea*	48	48	4				X	X
847	netleaf oak	*Quercus rugosa*	48	48	4				X	X
851	Chisos oak	*Quercus graciliformis*	26	47	4					X
8511	Graves oak	*Quercus gravesii*	26	47	4					X
8512	Mexican white oak	*Quercus polymorpha*	26	47	4					X
8513	Buckley oak	*Quercus buckleyi*	26	47	4					X
8514	Lacey oak	*Quercus laceyi*	26	47	4					X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
852	sea torchwood	*Amyris elemifera*	43	47	3					X
853	pond-apple	*Annona glabra*	43	47	3					X
854	gumbo limbo	*Bursera simaruba*	43	47	3					X
855	sheoak spp.	*Casuarina* spp.	43	47	3					X
856	gray sheoak	*Casuarina glauca*	43	47	3					X
857	belah	*Casuarina lepidophloia*	43	47	3					X
858	camphortree	*Cinnamomum camphora*	43	47	3					X
859	Florida fiddlewood	*Citharexylum fruticosum*	43	47	3					X
860	citrus spp.	*Citrus* spp.	43	47	3					X
863	tietongue, pigeon-plum	*Coccoloba diversifolia*	43	47	3					X
864	soldierwood	*Colubrina elliptica*	43	47	3					X
865	largeleaf geigertree	*Cordia sebestena*	43	47	3					X
866	carrotwood	*Cupaniopsis anacardioides*	43	47	3					X
867	bluewood	*Condalia hookeri*	48	48	4					X
868	blackbead ebony	*Ebenopsis ebano*	42	47	4					X
869	great leucaene	*Leucaena pulverulenta*	43	47	3					X
870	Texas sophora	*Sophora affinis*	42	47	4					X
873	red stopper	*Eugenia rhombea*	43	47	3					X
874	butterbough, inkwood	*Exothea paniculata*	43	47	3					X
876	Florida strangler fig	*Ficus aurea*	43	47	3					X
877	wild banyantree, shortleaf fig	*Ficus citrifolia*	43	47	3					X
882	beeftree, longleaf blolly	*Guapira discolor*	43	47	3					X
883	manchineel	*Hippomane mancinella*	43	47	3					X
884	false tamarind	*Lysiloma latisiliquum*	43	47	3					X
885	mango	*Mangifera indica*	43	47	3					X
886	Florida poisontree	*Metopium toxiferum*	43	47	3					X
887	fishpoison tree	*Piscidia piscipula*	43	47	3					X
888	octopus tree, schefflera	*Schefflera actinophylla*	43	47	3					X
890	false mastic	*Sideroxylon foetidissimum*	43	47	3					X
891	white bully, willow bustic	*Sideroxylon salicifolium*	43	47	3					X
895	paradisetree	*Simarouba glauca*	43	47	3					X
896	Java plum	*Syzygium cumini*	43	47	3					X
897	tamarind	*Tamarindus indica*	43	47	3					X
901	black locust	*Robinia pseudoacacia*	42	47	4	X	X	X	X	X
902	New Mexico locust	*Robinia neomexicana*	48	48	4					X
906	Everglades palm, paurotis-palm	*Acoelorraphe wrightii*	43	47	3					X
907	Florida silver palm	*Coccothrinax argentata*	43	47	3					X
908	coconut palm	*Cocos nucifera*	43	47	3					X
909	royal palm spp.	*Roystonea* spp.	43	47	3					X
911	Mexican palmetto	*Sabal mexicana*	41	47	3					X
912	cabbage palmetto	*Sabal palmetto*	43	47	3					X
913	key thatch palm	*Thrinax morrisii*	43	47	3					X
914	Florida thatch palm	*Thrinax radiata*	43	47	3					X
915	other palms	Family Arecaceae not listed above	43	47	3					X
919	western soapberry	*Sapindus saponaria* var. *drummondii*	43	47	4	X				X
920	willow spp.	*Salix* spp.	43	47	3	X	X	X		X

SPCD	COMMON_NAME	Scientific Name	SPGRPCD		MAJGRP	Occurrence by FIA work unit				
			East	West		NC	NE	PNW	RM	SO
921	peachleaf willow	*Salix amygdaloides*	43	47	3	X	X			X
922	black willow	*Salix nigra*	41	47	3	X	X	X		X
923	Bebb willow	*Salix bebbiana*	43	47	3	X	X			X
924	Bonpland willow	*Salix bonplandiana*	41	47	3					X
925	coastal plain willow	*Salix caroliniana*	43	47	3	X	X			X
926	balsam willow	*Salix pyrifolia*	43	47	3	X	X	X		
927	white willow	*Salix alba*	41	47	3	X	X			X
928	Scouler's willow	*Salix scouleriana*	41	47	3	X		X		
929	weeping willow	*Salix sepulcralis*	41	47	3	X	X			X
931	sassafras	*Sassafras albidum*	41	47	3	X	X			X
934	mountain-ash spp.	*Sorbus* spp.	43	47	4	X	X			X
935	American mountain-ash	*Sorbus americana*	43	47	4	X	X			X
936	European mountain-ash	*Sorbus aucuparia*	43	47	4		X			X
937	northern mountain-ash	*Sorbus decora*	43	47	4	X	X			
940	West Indian mahogany	*Swietenia mahagoni*	43	47	4					X
950	basswood spp.	*Tilia* spp.	38	47	3	X	X			X
951	American basswood	*Tilia americana*	38	47	3	X	X			X
952	white basswood	*Tilia americana* var. *heterophylla*	38	47	3	X	X			X
953	Carolina basswood	*Tilia americana* var. *caroliniana*	38	47	3	X				X
970	elm spp.	*Ulmus* spp.	41	47	3	X	X			X
971	winged elm	*Ulmus alata*	41	47	4	X	X			X
972	American elm	*Ulmus americana*	41	47	3	X	X		X	X
973	cedar elm	*Ulmus crassifolia*	41	47	3	X				X
974	Siberian elm	*Ulmus pumila*	41	47	3	X	X		X	X
975	slippery elm	*Ulmus rubra*	41	47	3	X	X			X
976	September elm	*Ulmus serotina*	41	47	3	X				X
977	rock elm	*Ulmus thomasii*	42	47	4	X	X			X
981	California-laurel	*Umbellularia californica*	43	47	4			X		
982	Joshua tree	*Yucca brevifolia*	43	47	3			X		
986	black-mangrove	*Avicennia germinans*	43	47	4					X
987	buttonwood-mangrove	*Conocarpus erectus*	43	47	4					X
988	white-mangrove	*Laguncularia racemosa*	43	47	4					X
989	American mangrove	*Rhizophora mangle*	43	47	4					X
990	desert ironwood	*Olneya tesota*	48	48	4			X		
991	saltcedar	*Tamarix* spp.	43	47	3	X		X		
992	melaleuca	*Melaleuca quinquenervia*	41	47	3					X
993	chinaberry	*Melia azedarach*	43	47	4	X				X
994	Chinese tallowtree	*Triadica sebifera*	43	47	4					X
995	tungoil tree	*Vernicia fordii*	43	47	4					X
996	smoketree	*Cotinus obovatus*	43	47	4	X				X
997	Russian-olive	*Elaeagnus angustifolia*	43	47	3	X	X	X		X
998	Unknown dead hardwood	Tree broadleaf	43	47	3	X	X	X		X
999	Other or unknown live tree	Tree unknown	43	47	3	X	X	X		X

Appendix G. Caribbean Tree Species Codes, Names, and Occurrences

Major groups (MAJGRP) are (1) pines, (2) other softwoods, (3) soft hardwoods, and (4) hard hardwoods. The species groups (SPGRPCD) can be found in appendix E.

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
0050	cypress	*Cupressus* spp.	52	2
0100	pine spp.	*Pinus* spp.	51	1
0223	Montezuma baldcypress	*Taxodium mucronatum*	52	2
0240	thuja spp.	*Thuja* spp.	52	2
0299	Unknown dead conifer	*Tree evergreen*	52	2
0300	acacia spp.	*Acacia* spp.	54	3
0303	sweet acacia	*Acacia farnesiana*	54	3
0450	catalpa spp.	*Catalpa* spp.	54	4
0460	hackberry spp.	*Celtis* spp.	54	3
0510	eucalyptus spp.	*Eucalyptus* spp.	54	4
0511	Tasmanian bluegum	*Eucalyptus globulus*	54	4
0513	grand eucalyptus	*Eucalyptus grandis*	54	4
0514	swampmahogany	*Eucalyptus robusta*	54	4
0520	persimmon spp.	*Diospyros* spp.	54	4
0540	ash spp.	*Fraxinus* spp.	54	3
0600	walnut spp.	*Juglans* spp.	54	4
0650	magnolia spp.	*Magnolia* spp.	54	3
0680	mulberry spp.	*Morus* spp.	54	4
0681	white mulberry	*Morus alba*	54	4
0684	black mulberry	*Morus nigra*	54	4
0720	bay spp.	*Persea* spp.	54	3
7211	avocado	*Persea americana*	54	3
0755	mesquite spp.	*Prosopis* spp.	54	4
0760	cherry and plum spp.	*Prunus* spp.	54	4
0852	sea torchwood	*Amyris elemifera*	54	3
0853	pond-apple	*Annona glabra*	54	3
0854	gumbo limbo	*Bursera simaruba*	54	3
0855	sheoak spp.	*Casuarina* spp.	54	3
0856	gray sheoak	*Casuarina glauca*	54	3
0857	belah	*Casuarina lepidophloia*	54	3
0858	camphortree	*Cinnamomum camphora*	54	3
0859	Florida fiddlewood	*Citharexylum fruticosum*	54	3
0860	citrus spp.	*Citrus* spp.	54	3
0863	tietongue, pigeon-plum	*Coccoloba diversifolia*	54	3
0864	soldierwood	*Colubrina elliptica*	54	3
0865	largeleaf geigertree	*Cordia sebestena*	54	3
0873	red stopper	*Eugenia rhombea*	54	3
0874	butterbough, inkwood	*Exothea paniculata*	54	3

0877	wild banyantree, shortleaf fig	*Ficus citrifolia*	54	3
0882	beeftree, longleaf blolly	*Guapira discolor*	54	3
0883	manchineel	*Hippomane mancinella*	54	3
0884	false tamarind	*Lysiloma latisiliquum*	54	3
0885	mango	*Mangifera indica*	54	3
0886	Florida poisontree	*Metopium toxiferum*	54	3
0888	octopus tree, schefflera	*Schefflera actinophylla*	54	3
0890	false mastic	*Sideroxylon foetidissimum*	54	3
0891	white bully, willow bustic	*Sideroxylon salicifolium*	54	3
0897	tamarind	*Tamarindus indica*	54	3
0908	coconut palm	*Cocos nucifera*	53	3
0909	royal palm spp.	*Roystonea* spp.	53	3
0913	key thatch palm	*Thrinax morrisii*	53	3
0914	Florida thatch palm	*Thrinax radiata*	54	3
0920	willow spp.	*Salix* spp.	54	3
0940	West Indian mahogany	*Swietenia mahagoni*	54	4
0986	black-mangrove	*Avicennia germinans*	54	4
0987	buttonwood-mangrove	*Conocarpus erectus*	54	4
0988	white-mangrove	*Laguncularia racemosa*	54	4
0989	American mangrove	*Rhizophora mangle*	54	4
0991	saltcedar	*Tamarix* spp.	54	3
0992	melaleuca	*Melaleuca quinquenervia*	54	3
0993	chinaberry	*Melia azedarach*	54	4
0995	tungoil tree	*Vernicia fordii*	54	4
0998	Unknown dead hardwood	*Tree broadleaf*	54	3
0999	Other or unknown live tree	*Tree unknown*	54	3
6001	blackbrush wattle	*Acacia anegadensis*	54	3
6008	porknut	*Acacia macracantha*	54	3
6009	Acacia mangium	*Acacia mangium*	54	3
6012	spineless wattle	*Acacia muricata*	54	3
6013	gum arabic tree	*Acacia nilotica*	54	3
6015	Acacia polyacantha	*Acacia polyacantha*	54	3
6018	poponax	*Acacia tortuosa*	54	3
6021	hollowheart	*Acnistus arborescens*	54	3
6023	grugru palm	*Acrocomia media*	53	3
6025	baobab	*Adansonia digitata*	54	3
6026	wild lime	*Adelia ricinella*	54	3
6028	red beadtree	*Adenanthera pavonina*	54	3
6032	Caribbean spiritweed	*Aegiphila martinicensis*	54	3
6036	kauri	*Agathis australis*	54	3
6037	Queensland kauri	*Agathis robusta*	54	3
6053	Aiphanes minima	*Aiphanes minima*	54	3
6055	cream albizia	*Albizia adinocephala*	54	3

6056	naked albizia	*Albizia carbonaria*	54	3
6059	woman's tongue	*Albizia lebbeck*	54	3
6060	tall albizia	*Albizia procera*	54	3
6064	achiotillo	*Alchornea latifolia*	54	3
6066	palo de gallina	*Alchorneopsis floribunda*	54	3
6075	Indian walnut	*Aleurites moluccana*	54	3
6080	palo blanco	*Allophylus crassinervis*	54	3
6082	palo de caja	*Allophylus racemosus*	54	3
6092	helecho gigante de la sierra	*Alsophila bryophila*	54	3
6093	Alsophila portoricensis	*Alsophila portoricensis*	54	3
6101	black calabash	*Amphitecna latifolia*	54	3
6103	balsam torchwood	*Amyris balsamifera*	54	3
6106	anacardium	*Anacardium spp.*	54	3
6107	cashew	*Anacardium occidentale*	54	3
6111	Anadenanthera peregrina	*Anadenanthera peregrina*	54	3
6114	cabbagebark tree	*Andira inermis*	54	3
6120	canelillo	*Aniba bracteata*	54	3
6124	Annona cherimola	*Annona cherimola*	54	3
6125	ilama	*Annona diversifolia*	54	3
6127	mountain soursop	*Annona montana*	54	3
6128	soursop	*Annona muricata*	54	3
6129	custard apple	*Annona reticulata*	54	3
6131	sugar apple	*Annona squamosa*	54	3
6137	Antidesma bunius	*Antidesma bunius*	54	3
6146	placa chiquitu	*Antirhea acutata*	54	3
6147	pegwood	*Antirhea coriacea*	54	3
6149	palo iloron	*Antirhea lucida*	54	3
6150	quina roja	*Antirhea obtusifolia*	54	3
6151	Puerto Rico quina	*Antirhea portoricensis*	54	3
6152	Sintenis' quina	*Antirhea sintenisii*	54	3
6154	parana pine	*Araucaria angustifolia*	54	3
6157	Norfolk Island pine	*Araucaria heterophylla*	54	3
6162	ausubon	*Ardisia glauciflora*	54	3
6163	mountain marlberry	*Ardisia luquillensis*	54	3
6164	Guadeloupe marlberry	*Ardisia obovata*	54	3
6165	China-shrub	*Ardisia solanacea*	54	3
6171	breadfruit	*Artocarpus altilis*	54	3
6173	Artocarpus heterophyllus	*Artocarpus heterophyllus*	54	3
6198	carambola	*Averrhoa carambola*	54	3
6206	neem	*Azadirachta indica*	54	3
6216	common bamboo	*Bambusa vulgaris*	54	3
6217	Puerto Rico palo de ramon	*Banara portoricensis*	54	3
6219	Vanderbilt's palo de ramon	*Banara vanderbiltii*	54	3

6220	sea putat	*Barringtonia asiatica*	54	3
6224	Bastardiopsis eggersii	*Bastardiopsis eggersii*	54	3
6226	Napoleon's plume	*Bauhinia monandra*	54	3
6227	petite flamboyant bauhinia	*Bauhinia multinervia*	54	3
6228	railroadfence	*Bauhinia pauletia*	54	3
6229	butterfly tree	*Bauhinia purpurea*	54	3
6231	St. Thomas tree	*Bauhinia tomentosa*	54	3
6232	mountain ebony	*Bauhinia variegata*	54	3
6233	slugwood	*Beilschmiedia pendula*	54	3
6235	Caribbean myrtlecroton	*Bernardia dichotoma*	54	3
6238	lipsticktree	*Bixa orellana*	54	3
6240	akee	*Blighia sapida*	54	3
6247	parrotweed	*Bocconia frutescens*	54	3
6251	white alling	*Bontia daphnoides*	54	3
6253	Bourreria radula	*Bourreria radula*	54	3
6255	bodywood	*Bourreria succulenta*	54	3
6257	roble de guayo	*Bourreria virgata*	54	3
6270	West Indian sumac	*Brunellia comocladiifolia*	54	3
6272	American brunfelsia	*Brunfelsia americana*	54	3
6273	Serpentine Hill raintree	*Brunfelsia densifolia*	54	3
6274	vega blanca	*Brunfelsia lactea*	54	3
6275	Puerto Rico raintree	*Brunfelsia portoricensis*	54	3
6283	fourleaf buchenavia	*Buchenavia tetraphylla*	54	3
6284	gregorywood	*Bucida buceras*	54	3
6294	cafe falso	*Bunchosia glandulifera*	54	3
6295	cafe forastero	*Bunchosia glandulosa*	54	3
6297	Bunchosia polystachia	*Bunchosia polystachia*	54	3
6303	Buxus laevigata	*Buxus laevigata*	54	3
6304	Puerto Rico box	*Buxus portoricensis*	54	3
6306	Vahl's box	*Buxus vahlii*	54	3
6308	maricao cimun	*Byrsonima crassifolia*	54	3
6311	Long Key locustberry	*Byrsonima lucida*	54	3
6313	doncella	*Byrsonima spicata*	54	3
6315	almendrillo	*Byrsonima wadsworthii*	54	3
6316	nicker	*Caesalpinia spp.*	54	3
6317	divi divi	*Caesalpinia coriaria*	54	3
6319	pride-of-Barbados	*Caesalpinia pulcherrima*	54	3
6320	sappanwood	*Caesalpinia sappan*	54	3
6325	Surinamese stickpea	*Calliandra surinamensis*	54	3
6326	caparosa	*Callicarpa ampla*	54	3
6328	crimson bottlebrush	*Callistemon citrinus*	54	3
6331	Callitris columellaris	*Callitris columellaris*	52	2
6337	Caloncoba echinata	*Caloncoba echinata*	54	3
6338	Antilles calophyllum	*Calophyllum antillanum*	54	3

6341	Alexandrian laurel	*Calophyllum inophyllum*	54	3
6346	roostertree	*Calotropis procera*	54	3
6350	degame	*Calycophyllum candidissimum*	54	3
6351	Kiaerskov's lidflower	*Calyptranthes kiaerskovii*	54	3
6352	limoncillo	*Calyptranthes krugii*	54	3
6353	Luquillo forest lidflower	*Calyptranthes luquillensis*	54	3
6354	pale lidflower	*Calyptranthes pallens*	54	3
6355	Puerto Rico lidflower	*Calyptranthes portoricensis*	54	3
6356	limoncillo de monte	*Calyptranthes sintenisii*	54	3
6358	Thomas' lidflower	*Calyptranthes thomasiana*	54	3
6359	myrtle of the river	*Calyptranthes zuzygium*	53	3
6360	Puerto Rico manac	*Calyptronoma rivalis*	54	3
6370	ilang-ilang	*Cananga odorata*	54	3
6380	wild cinnamon	*Canella winteriana*	54	3
6383	burro blanco	*Capparis amplissima*	54	3
6384	caper	*Capparis baducca*	54	3
6386	Jamaican caper	*Capparis cynophallophora*	54	3
6387	falseteeth	*Capparis flexuosa*	54	3
6389	broadleaf caper	*Capparis hastata*	54	3
6390	linguam	*Capparis indica*	54	3
6393	crabwood	*Carapa guianensis*	54	3
6395	papaya	*Carica papaya*	54	3
6402	rabo de ranton	*Casearia aculeata*	54	3
6403	gia verde	*Casearia arborea*	54	3
6406	wild honeytree	*Casearia decandra*	54	3
6407	Guyanese wild coffee	*Casearia guianensis*	54	3
6410	crackopen	*Casearia sylvestris*	54	3
6415	golden shower	*Cassia fistula*	54	3
6417	pink shower	*Cassia grandis*	54	3
6418	apple blossom	*Cassia javanica*	54	3
6425	marbletree	*Cassine xylocarpa*	54	3
6427	goatwood	*Cassipourea guianensis*	54	3
6429	goatbush	*Castela erecta*	54	3
6430	Panama rubbertree	*Castilla elastica*	54	3
6433	river sheoak	*Casuarina cunninghamiana*	54	3
6434	beach sheoak	*Casuarina equisetifolia*	54	3
6439	Haitian catalpa	*Catalpa longissima*	54	3
6443	pumpwood	*Cecropia schreberiana*	54	3
6445	Spanish cedar	*Cedrela odorata*	54	3
6447	pochote	*Ceiba acuminata*	54	3
6448	pochote	*Ceiba aesculifolia*	54	3
6449	kapoktree	*Ceiba pentandra*	54	3
6454	almex	*Celtis trinervia*	54	3
6457	St. John's bread	*Ceratonia siliqua*	54	3

6468	lady of the night cactus	*Cereus hexagonus*	54	3
6469	Cereus hildmannianus	*Cereus hildmannianus*	54	3
6474	day jessamine	*Cestrum diurnum*	54	3
6475	galen del monte	*Cestrum laurifolium*	54	3
6477	night jessamine	*Cestrum nocturnum*	54	3
6481	jointed sandmat	*Chamaesyce articulata*	54	3
6519	hueso	*Chionanthus axilliflorus*	54	3
6520	bridgotree	*Chionanthus compactus*	54	3
6521	white rosewood	*Chionanthus domingensis*	54	3
6522	hueso prieto	*Chionanthus holdridgei*	54	3
6523	cabra blanca	*Chionanthus ligustrinus*	54	3
6526	puntaj jayuya	*Chione seminervis*	54	3
6528	fatpork	*Chione venosa*	54	3
6529	african teak	*Chlorophora excelsa*	54	3
6532	silk-floss tree	*Chorisia speciosa*	54	3
6535	icaco coco plum	*Chrysobalanus icaco*	54	3
6539	bastard redwood	*Chrysophyllum argenteum*	54	3
6541	star apple	*Chrysophyllum cainito*	54	3
6542	satinleaf	*Chrysophyllum oliviforme*	54	3
6543	camito de perro	*Chrysophyllum pauciflorum*	54	3
6554	cassia	*Cinnamomum aromaticum*	54	3
6559	laurel avispillo	*Cinnamomum elongatum*	54	3
6560	avispillo	*Cinnamomum montanum*	54	3
6564	cinnamon	*Cinnamomum verum*	54	3
6565	juniper berry	*Citharexylum caudatum*	54	3
6567	spiny fiddlewood	*Citharexylum spinosum*	54	3
6569	threespike fiddlewood	*Citharexylum tristachyum*	54	3
6573	key lime	*Citrus xaurantiifolia*	54	3
6574	sour orange	*Citrus xaurantium*	54	3
6575	lemon	*Citrus xlimon*	54	3
6576	grapefruit	*Citrus xparadisi*	54	3
6577	sweet orange	*Citrus xsinensis*	54	3
6581	Citrus maxima	*Citrus maxima*	54	3
6582	Citrus medica	*Citrus medica*	54	3
6584	Citrus reticulata	*Citrus reticulata*	54	3
6631	haggarbush	*Clerodendrum aculeatum*	54	3
6637	teta prieta	*Cleyera albopunctata*	54	3
6639	jackass breadnut	*Clibadium erosum*	54	3
6641	Clidemia cymosa	*Clidemia cymosa*	54	3
6642	soapbush	*Clidemia hirta*	54	3
6644	Philippine pigeonwings	*Clitoria fairchildiana*	54	3
6646	cupeillo	*Clusia clusioides*	54	3
6648	Grundlach's attorney	*Clusia gundlachii*	54	3
6650	cupey de monte	*Clusia minor*	54	3

6651	Scotch attorney	*Clusia rosea*	54	3
6653	deepwoods fern	*Cnemidaria horrida*	54	3
6655	treadsoftly	*Cnidoscolus aconitifolius*	54	3
6658	uvilla	*Coccoloba costata*	54	3
6660	whitewood	*Coccoloba krugii*	54	3
6661	puckhout	*Coccoloba microstachya*	54	3
6662	pale seagrape	*Coccoloba pallida*	54	3
6663	grandleaf seagrape	*Coccoloba pubescens*	54	3
6664	uvera	*Coccoloba pyrifolia*	54	3
6665	ortegon	*Coccoloba rugosa*	54	3
6666	uvero de monte	*Coccoloba sintenisii*	54	3
6668	Swartz's pigeonplum	*Coccoloba swartzii*	54	3
6669	Bahama pigeonplum	*Coccoloba tenuifolia*	54	3
6670	seagrape	*Coccoloba uvifera*	54	3
6671	false chiggergrape	*Coccoloba venosa*	54	3
6673	Coccothrinax barbadensis	*Coccothrinax barbadensis*	54	3
6679	silk cottontree	*Cochlospermum vitifolium*	53	3
6683	garden croton	*Codiaeum variegatum*	54	3
6684	Arabian coffee	*Coffea arabica*	54	3
6686	Coffea liberica	*Coffea liberica*	54	3
6688	Cojoba arborea	*Cojoba arborea*	54	3
6689	abata cola	*Cola acuminata*	54	3
6693	greenheart	*Colubrina arborescens*	54	3
6700	Urban's nakedwood	*Colubrina verrucosa*	54	3
6705	poison ash	*Comocladia dodonaea*	54	3
6706	carrasco	*Comocladia glabra*	54	3
6710	Luquillo Mountain snailwood	*Conostegia rufescens*	54	3
6711	Consolea moniliformis	*Consolea moniliformis*	54	3
6712	Consolea rubescens	*Consolea rubescens*	54	3
6714	copaiba	*Copaifera officinalis*	54	3
6728	Spanish elm	*Cordia alliodora*	54	3
6730	muneco	*Cordia borinquensis*	54	3
6731	red manjack	*Cordia collococca*	54	3
6735	smooth manjack	*Cordia laevigata*	54	3
6737	clammy cherry	*Cordia obliqua*	54	3
6738	San Bartolome	*Cordia rickseckeri*	54	3
6739	Puerto Rico manjack	*Cordia rupicola*	54	3
6743	mucilage manjack	*Cordia sulcata*	54	3
6746	nigua	*Cornutia obovata*	54	3
6747	azulejo	*Cornutia pyramidata*	54	3
6750	Corymbia citriodora	*Corymbia citriodora*	54	3
6756	cannonball tree	*Couroupita guianensis*	54	3
6761	common calabash tree	*Crescentia cujete*	54	3
6762	higuerito	*Crescentia linearifolia*	54	3

6763	higuero de sierra	*Crescentia portoricensis*	54	3
6765	Critonia portoricensis	*Critonia portoricensis*	54	3
6767	maidenberry	*Crossopetalum rhacoma*	54	3
6773	wild marrow	*Croton astroites*	54	3
6774	Croton flavens	*Croton flavens*	54	3
6775	sabinon	*Croton poecilanthus*	54	3
6786	Japanese cedar	*Cryptomeria japonica*	52	2
6788	Chinese fir	*Cunninghamia lanceolata*	52	2
6790	wild ackee	*Cupania americana*	54	3
6792	guara blanca	*Cupania triquetra*	54	3
6795	cedar-of-Goa	*Cupressus lusitanica*	52	2
6796	Italian cypress	*Cupressus sempervirens*	52	2
6834	parrotfeather treefern	*Cyathea andina*	54	3
6835	West Indian treefern	*Cyathea arborea*	54	3
6839	Jamaican treefern	*Cyathea furfuracea*	54	3
6843	small treefern	*Cyathea parvula*	54	3
6848	helecho gigante	*Cyathea tenera*	54	3
6850	Cybianthus sintenisii	*Cybianthus sintenisii*	54	3
6852	queen sago	*Cycas circinalis*	54	3
6857	oreganillo falso	*Cynometra portoricensis*	54	3
6862	swamp titi	*Cyrilla racemiflora*	54	3
6867	candletree	*Dacryodes excelsa*	54	3
6869	Indian rosewood	*Dalbergia sissoo*	54	3
6871	burn nose	*Daphnopsis americana*	54	3
6872	Heller's cieneguillo	*Daphnopsis helleriana*	54	3
6873	emajagua de sierra	*Daphnopsis philippiana*	54	3
6883	royal poinciana	*Delonix regia*	54	3
6888	angelica tree	*Dendropanax arboreus*	54	3
6889	palo de vaca	*Dendropanax laurifolius*	54	3
6896	chulta	*Dillenia indica*	54	3
6899	Dimocarpus longan	*Dimocarpus longan*	54	3
6909	black apple	*Diospyros revoluta*	54	3
6912	Chinese persimmon	*Diospyros sintenisii*	54	3
6923	jaboncillo	*Ditta myricoides*	54	3
6927	Florida hopbush	*Dodonaea viscosa*	54	3
6930	Ceylon gooseberry	*Dovyalis hebecarpa*	54	3
6932	fragrant dracaena	*Dracaena fragrans*	54	3
6937	cafeillo	*Drypetes alba*	54	3
6938	varital	*Drypetes glauca*	54	3
6939	rosewood	*Drypetes ilicifolia*	54	3
6940	guiana plum	*Drypetes lateriflora*	54	3
6961	golden dewdrops	*Duranta erecta*	54	3
6966	Dypsis lutescens	*Dypsis lutescens*	54	3
6996	monkeysoap	*Enterolobium cyclocarpum*	54	3

6998	loquat	*Eriobotrya japonica*	54	3
7000	blacktorch	*Erithalis fruticosa*	54	3
7004	machete	*Erythrina berteriana*	54	3
7005	coral erythrina	*Erythrina corallodendron*	54	3
7006	crybabytree	*Erythrina crista-galli*	54	3
7007	cock's spur	*Erythrina eggersii*	54	3
7008	bucayo	*Erythrina fusca*	54	3
7011	mountain immortelle	*Erythrina poeppigiana*	54	3
7015	tiger's claw	*Erythrina variegata*	54	3
7016	tiger's claw	*Erythrina variegata var. orientalis*	54	3
7019	swamp-redwood	*Erythroxylum areolatum*	54	3
7021	ratwood	*Erythroxylum rotundifolium*	54	3
7022	rufous false cocaine	*Erythroxylum rufum*	54	3
7024	Urban's false cocaine	*Erythroxylum urbanii*	54	3
7034	Indonesian gum	*Eucalyptus deglupta*	54	3
7043	spotted gum	*Eucalyptus maculata*	54	3
7046	gray ironbark	*Eucalyptus paniculata*	54	3
7049	redmahogany	*Eucalyptus resinifera*	54	3
7053	Sydney bluegum	*Eucalyptus saligna*	54	3
7060	white stopper	*Eugenia axillaris*	54	3
7061	blackrodwood	*Eugenia biflora*	54	3
7062	Sierra de Cayey stopper	*Eugenia boqueronensis*	54	3
7063	guayabota de sierra	*Eugenia borinquensis*	54	3
7066	redberry stopper	*Eugenia confusa*	54	3
7067	lathberry	*Eugenia cordata*	54	3
7068	lathberry	*Eugenia cordata var. sintenisii*	54	3
7069	sperry guava	*Eugenia corozalensis*	54	3
7071	serrette guave	*Eugenia domingensis*	54	3
7072	guasabara	*Eugenia eggersii*	54	3
7075	smooth rodwood	*Eugenia glabrata*	54	3
7076	Luquillo Mountain stopper	*Eugenia haematocarpa*	54	3
7081	privet stopper	*Eugenia ligustrina*	54	3
7084	birdcherry	*Eugenia monticola*	54	3
7089	rockmyrtle	*Eugenia procera*	54	3
7090	Christmas cherry	*Eugenia pseudopsidium*	54	3
7093	serrasuela	*Eugenia serrasuela*	54	3
7094	sessileleaf stopper	*Eugenia sessiliflora*	54	3
7098	Stahl's stopper	*Eugenia stahlii*	54	3
7100	Stewardson's stopper	*Eugenia stewardsonii*	54	3
7103	Underwood's stopper	*Eugenia underwoodii*	54	3
7104	Surinam cherry	*Eugenia uniflora*	54	3
7105	aridland stopper	*Eugenia xerophytica*	54	3
7109	Mexican shrubby spurge	*Euphorbia cotinifolia*	54	3

7111	mottled spurge	*Euphorbia lactea*	54	3
7112	Indian spurgetree	*Euphorbia neriifolia*	54	3
7113	manchineel berry	*Euphorbia petiolaris*	54	3
7116	Indiantree spurge	*Euphorbia tirucalli*	54	3
7135	Caribbean princewood	*Exostema caribaeum*	54	3
7136	plateado	*Exostema ellipticum*	54	3
7137	Exostema sanctae-luciae	*Exostema sanctae-luciae*	54	3
7146	false coffee	*Faramea occidentalis*	54	3
7148	Jamaican cherry fig	*Ficus americana*	54	3
7149	Indian banyan	*Ficus benghalensis*	54	3
7150	weeping fig	*Ficus benjamina*	54	3
7151	edible fig	*Ficus carica*	54	3
7154	brown-woolly fig	*Ficus drupacea*	54	3
7155	Indian rubberplant	*Ficus elastica*	54	3
7158	Ficus lutea	*Ficus lutea*	54	3
7159	fiddleleaf fig	*Ficus lyrata*	54	3
7160	Chinese banyan	*Ficus microcarpa*	54	3
7162	tibig	*Ficus nota*	54	3
7164	amate	*Ficus obtusifolia*	54	3
7166	peepul tree	*Ficus religiosa*	54	3
7173	jaguey	*Ficus stahlii*	54	3
7174	sycamore fig	*Ficus sycomorus*	54	3
7177	jaguey blanco	*Ficus trigonata*	54	3
7184	governor's plum	*Flacourtia indica*	54	3
7185	batoko plum	*Flacourtia inermis*	54	3
7190	Flueggea acidoton	*Flueggea acidoton*	54	3
7194	inkbush	*Forestiera eggersiana*	54	3
7195	caca ravet	*Forestiera rhamnifolia*	54	3
7196	Florida swampprivet	*Forestiera segregata*	54	3
7198	oval kumquat	*Fortunella margarita*	54	3
7202	West Indian buckthorn	*Frangula sphaerosperma*	54	3
7206	shamel ash	*Fraxinus uhdei*	54	3
7210	silkrubber	*Funtumia elastica*	54	3
7212	Gourka	*Garcinia dulcis*	53	3
7213	lemon saptree	*Garcinia hessii*	54	3
7214	mangosteen	*Garcinia mangostana*	54	3
7218	palo de cruz	*Garcinia portoricensis*	54	3
7223	Garcinia xanthochymus	*Garcinia xanthochymus*	54	3
7231	llume	*Gaussia attenuata*	54	3
7235	jagua	*Genipa americana*	54	3
7237	arbol de Navidad	*Gesneria pedunculosa*	54	3
7239	bastard gregre	*Ginoria rohrii*	54	3
7245	quickstick	*Gliricidia sepium*	54	3
7256	mata buey	*Goetzea elegans*	54	3

7258	grand merisier	*Gomidesia lindeniana*	54	3
7262	Creole cotton	*Gossypium barbadense*	54	3
7264	Gossypium hirsutum	*Gossypium hirsutum*	54	3
7268	Graffenrieda ottoschulzii	*Graffenrieda ottoschulzii*	54	3
7273	silkoak	*Grevillea robusta*	54	3
7279	lignum-vitae	*Guaiacum officinale*	54	3
7280	holywood	*Guaiacum sanctum*	54	3
7285	black mampoo	*Guapira fragrans*	54	3
7286	corcho prieto	*Guapira obtusata*	54	3
7288	alligatorwood	*Guarea glabra*	54	3
7290	American muskwood	*Guarea guidonia*	54	3
7294	haya minga	*Guatteria blainii*	54	3
7295	haya blanca	*Guatteria caribaea*	54	3
7298	bastardcedar	*Guazuma ulmifolia*	54	3
7299	hammock velvetseed	*Guettarda elliptica*	54	3
7300	frogwood	*Guettarda krugii*	54	3
7302	cucubano de vieques	*Guettarda odorata*	54	3
7303	cucubano	*Guettarda ovalifolia*	54	3
7305	roseta	*Guettarda pungens*	54	3
7306	wild guave	*Guettarda scabra*	54	3
7309	cucubano de monte	*Guettarda valenzuelana*	54	3
7315	West Indian false box	*Gyminda latifolia*	54	3
7317	oysterwood	*Gymnanthes lucida*	54	3
7321	bloodwoodtree	*Haematoxylum campechianum*	54	3
7327	palo de hueso	*Haenianthus salicifolius*	54	3
7330	scarletbush	*Hamelia patens*	54	3
7336	false locust	*Hebestigma cubense*	54	3
7341	cigarbush	*Hedyosmum arborescens*	54	3
7347	screwtree	*Helicteres jamaicensis*	54	3
7353	camasey peludo	*Henriettea fascicularis*	54	3
7354	MacFadyen's camasey	*Henriettea macfadyenii*	54	3
7355	thinleaf camasey	*Henriettea membranifolia*	54	3
7357	jusillo	*Henriettea squamulosum*	54	3
7366	mago	*Hernandia sonora*	54	3
7403	mahoe	*Hibiscus elatus*	54	3
7409	seaside mahoe	*Hibiscus pernambucensis*	54	3
7410	shoeblackplant	*Hibiscus rosa-sinensis*	54	3
7412	sea hibiscus	*Hibiscus tiliaceus*	54	3
7418	teta de burra cinarron	*Hirtella rugosa*	54	3
7420	pigeonberry	*Hirtella triandra*	54	3
7422	white cogwood	*Homalium racemosum*	54	3
7434	sandbox tree	*Hura crepitans*	54	3
7438	cedro macho	*Hyeronima clusioides*	54	3
7442	stinkingtoe	*Hymenaea courbaril*	54	3

7445	inkwood	*Hypelate trifoliata*	54	3
7446	limestone snakevine	*Hyperbaena laurifolia*	54	3
7455	dahoon	*Ilex cassine*	54	3
7456	te	*Ilex cookii*	54	3
7457	maconcona	*Ilex guianensis*	54	3
7458	Caribbean holly	*Ilex macfadyenii*	54	3
7459	Puerto Rico holly	*Ilex nitida*	54	3
7462	gongolin	*Ilex sideroxyloides*	54	3
7463	Sintenis' holly	*Ilex sintenisii*	54	3
7465	Urban's holly	*Ilex urbaniana*	54	3
7466	Ilex urbaniana	*Ilex urbaniana var. riedlaei*	54	3
7467	inga	*Inga spp.*	54	3
7470	sacky sac bean	*Inga laurina*	54	3
7471	Inga nobilis	*Inga nobilis*	54	3
7474	river koko	*Inga vera*	54	3
7479	palo de hierro	*Ixora ferrea*	54	3
7481	white jungleflame	*Ixora thwaitesii*	54	3
7482	black poui	*Jacaranda mimosifolia*	54	3
7485	braceletwood	*Jacquinia armillaris*	54	3
7487	bois bande	*Jacquinia berteroi*	54	3
7490	chirriador	*Jacquinia umbellata*	54	3
7491	Barbados nut	*Jatropha curcas*	54	3
7492	wild oilnut	*Jatropha hernandiifolia*	54	3
7493	coralbush	*Jatropha multifida*	54	3
7495	West Indian walnut	*Juglans jamaicensis*	54	3
7499	Khaya anthotheca	*Khaya anthotheca*	54	3
7501	Senegal mahogany	*Khaya senegalensis*	54	3
7503	Kigelia africana	*Kigelia africana*	54	3
7506	guest tree	*Kleinhovia hospita*	54	3
7508	Koanophyllon polyodon	*Koanophyllon polyodon*	54	3
7514	leadwood	*Krugiodendron ferreum*	54	3
7530	cuero de rana	*Laetia procera*	54	3
7532	crapemyrtle	*Lagerstroemia indica*	54	3
7533	pride of India	*Lagerstroemia speciosa*	54	3
7541	nino de cota	*Laplacea portoricensis*	54	3
7550	henna	*Lawsonia inermis*	54	3
7552	Krug's roughleaf	*Leandra krugiana*	54	3
7556	pitahaya	*Leptocereus quadricostatus*	54	3
7565	white leadtree	*Leucaena leucocephala*	54	3
7569	Maria laurel	*Licaria brittoniana*	54	3
7570	Puerto Rico cinnamon	*Licaria parvifolia*	54	3
7573	pepperleaf sweetwood	*Licaria triandra*	54	3
7574	Amur privet	*Ligustrum amurense*	54	3
7590	geno geno	*Lonchocarpus domingensis*	54	3

7591	geno	*Lonchocarpus glaucifolius*	54	3
7592	broadleaf lancepod	*Lonchocarpus heptaphyllus*	54	3
7600	luehea	*Luehea speciosa*	54	3
7604	lunania	*Lunania spp.*	54	3
7606	Lunania ekmanii	*Lunania ekmanii*	54	3
7608	St. Thomas staggerbush	*Lyonia rubiginosa*	54	3
7628	palo de hoz	*Machaerium lunatum*	54	3
7630	Puerto Rico alfilerillo	*Machaonia portoricensis*	54	3
7632	Maclura tinctoria	*Maclura tinctoria*	54	3
7633	umbrella-tree	*Maesopsis eminii*	54	3
7635	Puerto Rico magnolia	*Magnolia portoricensis*	54	3
7636	laurel magnolia	*Magnolia splendens*	54	3
7643	Singapore holly	*Malpighia coccigera*	54	3
7644	Barbados cherry	*Malpighia emarginata*	54	3
7645	palo bronco	*Malpighia fucata*	54	3
7646	wild crapemyrtle	*Malpighia glabra*	54	3
7647	cowhage cherry	*Malpighia infestissima*	54	3
7648	bastard cherry	*Malpighia linearis*	54	3
7652	mammee apple	*Mammea americana*	54	3
7662	bulletwood	*Manilkara bidentata*	54	3
7663	Surinam bulletwood	*Manilkara bidentata ssp. surinamensis*	54	3
7667	wild dilly	*Manilkara jaimiqui*	54	3
7669	zapote de costa	*Manilkara pleeana*	54	3
7673	nisperillo	*Manilkara valenzuela*	54	3
7674	sapodilla	*Manilkara zapota*	54	3
7677	palo de cana	*Mappia racemosa*	54	3
7682	bastard hogberry	*Margaritaria nobilis*	54	3
7684	beruquillo	*Marlierea sintenisii*	54	3
7688	Matayba apetala	*Matayba apetala*	54	3
7689	negra lora	*Matayba domingensis*	54	3
7695	Caribbean mayten	*Maytenus cymosa*	54	3
7697	Puerto Rico mayten	*Maytenus elongata*	54	3
7698	white cinnamon	*Maytenus laevigata*	54	3
7699	ponce mayten	*Maytenus ponceana*	54	3
7702	Mecranium latifolium	*Mecranium latifolium*	54	3
7717	Spanish lime	*Melicoccus bijugatus*	54	3
7763	aguacatillo	*Meliosma herbertii*	54	3
7764	cacaillo	*Meliosma obtusifolia*	54	3
7768	teabush	*Melochia tomentosa*	54	3
7803	hairy johnnyberry	*Miconia lanata*	54	3
7804	saquiyac	*Miconia affinis*	54	3
7806	Puerto Rico johnnyberry	*Miconia foveolata*	54	3
7807	camasey de costilla	*Miconia impetiolaris*	54	3
7808	smooth johnnyberry	*Miconia laevigata*	54	3

7810	camasey cuatrocanales	*Miconia mirabilis*	54	3
7812	camasey racimoso	*Miconia pachyphylla*	54	3
7813	granadillo bobo	*Miconia prasina*	54	3
7814	auquey	*Miconia punctata*	54	3
7815	ridge johnnyberry	*Miconia pycnoneura*	54	3
7816	camasey felpa	*Miconia racemosa*	54	3
7817	peralejo	*Miconia rubiginosa*	54	3
7818	jau jau	*Miconia serrulata*	54	3
7819	mountain johnnyberry	*Miconia sintenisii*	54	3
7821	forest johnnyberry	*Miconia subcorymbosa*	54	3
7822	rajador	*Miconia tetrandra*	54	3
7823	camasey tomaso	*Miconia thomasiana*	54	3
7828	caimitillo verde	*Micropholis garciniifolia*	54	3
7829	Micropholis guyanensis	*Micropholis guyanensis*	54	3
7833	elegant mimosa	*Mimosa arenosa*	54	3
7839	monodora	*Monodora spp.*	54	3
7845	Morella cerifera	*Morella cerifera*	54	3
7847	Morella holdridgeana	*Morella holdridgeana*	54	3
7849	Indian mulberry	*Morinda citrifolia*	54	3
7855	horseradishtree	*Moringa oleifera*	54	3
7857	ratapple	*Morisonia americana*	54	3
7862	murta	*Mouriri domingensis*	54	3
7863	mameyuelo	*Mouriri helleri*	54	3
7867	strawberrytree	*Muntingia calabura*	54	3
7869	Murraya exotica	*Murraya exotica*	54	3
7886	red rodwood	*Myrcia citrifolia*	54	3
7887	cieneguillo	*Myrcia deflexa*	54	3
7888	curame	*Myrcia fallax*	54	3
7889	guayabacon	*Myrcia leptoclada*	54	3
7890	ausu	*Myrcia paganii*	54	3
7891	punchberry	*Myrcia splendens*	54	3
7893	twinberry	*Myrcianthes fragrans*	54	3
7895	guavaberry	*Myrciaria floribunda*	54	3
7905	cercipo	*Myrospermum frutescens*	54	3
7907	balsam of Tolu	*Myroxylon balsamum*	54	3
7911	leathery colicwood	*Myrsine coriacea*	54	3
7912	Myrsine cubana	*Myrsine cubana*	54	3
7932	Nectandra coriacea	*Nectandra coriacea*	54	3
7933	shinglewood	*Nectandra hihua*	54	3
7934	Nectandra krugii	*Nectandra krugii*	54	3
7935	Nectandra membranacea	*Nectandra membranacea*	54	3
7936	Nectandra patens	*Nectandra patens*	54	3
7939	Nectandra turbacensis	*Nectandra turbacensis*	54	3
7940	saltwood	*Neea buxifolia*	54	3

7944	kadam	*Neolamarckia cadamba*	54	3
7946	aquilon	*Neolaugeria resinosa*	54	3
7956	oleander	*Nerium oleander*	54	3
7976	African bird's-eye bush	*Ochna mossambicensis*	54	3
7980	Ochroma pyramidale	*Ochroma pyramidale*	54	3
7990	laurel espada	*Ocotea floribunda*	54	3
7991	black sweetwood	*Ocotea foeniculacea*	54	3
7994	loblolly sweetwood	*Ocotea leucoxylon*	54	3
7996	nemoca	*Ocotea moschata*	54	3
7997	laurel sassafras	*Ocotea nemodaphne*	54	3
7999	laurel de paloma	*Ocotea portoricensis*	54	3
8001	nemoca cimarrona	*Ocotea spathulata*	54	3
8003	Wright's laurel canelon	*Ocotea wrightii*	54	3
8020	peronia	*Ormosia krugii*	54	3
8027	pincho palo de rosa	*Ottoschulzia rhodoxylon*	54	3
8029	chicharron amarillo	*Ouratea ilicifolia*	54	3
8030	abey amarillo	*Ouratea littoralis*	54	3
8032	guanabanilla	*Ouratea striata*	54	3
8033	blacklancewood	*Oxandra lanceolata*	54	3
8034	haya	*Oxandra laurifolia*	54	3
8037	wild chestnut	*Pachira insignis*	53	3
8045	tafetan	*Palicourea alpina*	54	3
8047	red cappel	*Palicourea crocea*	54	3
8049	Palicourea croceoides	*Palicourea croceoides*	54	3
8051	showy cappel	*Palicourea guianensis*	54	3
8088	common screwpine	*Pandanus utilis*	54	3
8099	scratchthroat	*Parathesis crenulata*	54	3
8106	parkia	*Parkia spp.*	54	3
8110	Parkia timoriana	*Parkia timoriana*	54	3
8111	Jerusalem thorn	*Parkinsonia aculeata*	54	3
8113	cuachilote	*Parmentiera aculeata*	54	3
8114	candle tree	*Parmentiera cereifera*	54	3
8121	Peltophorum pterocarpum	*Peltophorum pterocarpum*	54	3
8125	butter tree	*Pentadesma butyracea*	54	3
8127	jiqi	*Pera bumeliifolia*	54	3
8134	canela	*Persea krugii*	54	3
8138	aquacatillo	*Persea urbaniana*	54	3
8141	bastard stopper	*Petitia domingensis*	54	3
8143	aquilon prieto	*Phialanthus grandifolius*	54	3
8144	candlewood	*Phialanthus myrtilloides*	54	3
8157	Tahitian gooseberry tree	*Phyllanthus acidus*	54	3
8160	gamo de costa	*Phyllanthus juglandifolius*	54	3
8162	Phyllanthus orbicularis	*Phyllanthus orbicularis*	54	3
8164	Florida bitterbush	*Picramnia pentandra*	54	3

8167	bitterwood	*Picrasma excelsa*	54	3
8169	fustic	*Pictetia aculeata*	54	3
8171	aceitillo	*Pilocarpus racemosus*	54	3
8173	Royen's tree cactus	*Pilosocereus royenii*	54	3
8175	allspice	*Pimenta dioica*	54	3
8177	bayrumtree	*Pimenta racemosa*	54	3
8178	bayrumtree	*Pimenta racemosa var. grisea*	54	3
8183	Caribbean pine	*Pinus caribaea*	51	1
8184	Chinese red pine	*Pinus massoniana*	51	1
8185	Merkus pine	*Pinus merkusii*	51	1
8186	ocote chino	*Pinus oocarpa*	51	1
8187	Mexican weeping pine	*Pinus patula*	51	1
8190	higuillo de hoja menuda	*Piper aduncum*	54	3
8191	higuillo de limon	*Piper amalago*	54	3
8192	moth pepper	*Piper blattarum*	54	3
8193	Guyanese pepper	*Piper glabrescens*	54	3
8194	Jamaican pepper	*Piper hispidum*	54	3
8195	Caracas pepper	*Piper jacquemontianum*	54	3
8196	marigold pepper	*Piper marginatum*	54	3
8199	spanish elder	*Piper swartzianum*	54	3
8208	stinkwood	*Piscidia carthagenensis*	54	3
8211	corcho bobo	*Pisonia albida*	54	3
8216	water mampoo	*Pisonia subcordata*	54	3
8220	monkeypod	*Pithecellobium dulce*	54	3
8223	catclaw blackbead	*Pithecellobium unguis-cati*	54	3
8249	Oriental arborvitae	*Platycladus orientalis*	52	2
8255	chupa gallo	*Pleodendron macranthum*	54	3
8266	nosegaytree	*Plumeria alba*	54	3
8268	Singapore graveyard flower	*Plumeria obtusa*	54	3
8269	Plumeria obtusa	*Plumeria obtusa var. obtusa*	54	3
8271	templetree	*Plumeria rubra*	54	3
8273	yucca plum pine	*Podocarpus coriaceus*	54	3
8275	Poitea florida	*Poitea florida*	54	3
8276	Poitea punicea	*Poitea punicea*	54	3
8279	violet tree	*Polygala cowellii*	54	3
8280	crevajosa	*Polygala penaea*	54	3
8284	geranium aralia	*Polyscias guilfoylei*	54	3
8300	cocuyo	*Pouteria dictyoneura*	54	3
8301	redmammee	*Pouteria hotteana*	53	3
8302	bullytree	*Pouteria multiflora*	54	3
8305	mammee sapote	*Pouteria sapota*	54	3
8311	Prestoea acuminata	*Prestoea acuminata*	54	3
8340	guasimilla	*Prockia crucis*	54	3
8342	jand	*Prosopis cineraria*	54	3

8344	kiawe	*Prosopis pallida*	54	3
8346	West Indian cherry	*Prunus myrtifolia*	54	3
8347	western cherry laurel	*Prunus occidentalis*	54	3
8349	Prunus serotina	*Prunus serotina ssp. capuli*	54	3
8352	false breadnut	*Pseudolmedia spuria*	54	3
8353	Florida cherry palm	*Pseudophoenix sargentii*	54	3
8354	mountain guava	*Psidium amplexicaule*	54	3
8356	guava	*Psidium guajava*	54	3
8358	Psidium longipes	*Psidium longipes*	54	3
8359	Sintenis' guava	*Psidium sintenisii*	54	3
8361	cachimbo-cumun	*Psychotria berteriana*	54	3
8362	palo de cachimbo	*Psychotria brachiata*	54	3
8363	Browne's wild coffee	*Psychotria brownei*	54	3
8364	Psychotria domingensis	*Psychotria domingensis*	54	3
8367	cachimbo grande	*Psychotria grandis*	54	3
8389	cachimbo de gato	*Psychotria maleolens*	54	3
8391	cachimbo de maricao	*Psychotria maricaensis*	54	3
8394	thicket wild coffee	*Psychotria microdon*	54	3
8395	floating balsamo	*Psychotria nutans*	54	3
8397	hairy wild coffee	*Psychotria pubescens*	54	3
8407	pterocarpus	*Pterocarpus indicus*	54	3
8408	Burma padauk	*Pterocarpus macrocarpus*	54	3
8409	Malabar kino	*Pterocarpus marsupium*	54	3
8410	dragonsblood tree	*Pterocarpus officinalis*	54	3
8419	pomegranate	*Punica granatum*	54	3
8422	swizzlestick tree	*Quararibea turbinata*	54	3
8425	white indigoberry	*Randia aculeata*	54	3
8433	palo amargo	*Rauvolfia nitida*	54	3
8436	traveler's tree	*Ravenala madagascariensis*	54	3
8439	tortugo prieto	*Ravenia urbanii*	54	3
8444	guama	*Reynosia guama*	53	3
8445	Krug's darlingplum	*Reynosia krugii*	53	3
8447	sloe	*Reynosia uncinata*	53	3
8472	castorbean	*Ricinus communis*	54	3
8476	greenheart ebony	*Rochefortia acanthophora*	54	3
8478	Rochefortia spinosa	*Rochefortia spinosa*	54	3
8481	wild sugar apple	*Rollinia mucosa*	54	3
8483	cordobancillo	*Rondeletia inermis*	54	3
8484	cordobancillo peludo	*Rondeletia pilosa*	54	3
8485	Juan Tomas	*Rondeletia portoricensis*	54	3
8489	Puerto Rico royal palm	*Roystonea borinquena*	54	3
8490	Roystonea elata	*Roystonea elata*	54	3
8494	Puerto Rico palmetto	*Sabal causiarum*	54	3
8499	white hogwood	*Sagraea umbrosa*	54	3

8501	Salix humboldtiana	*Salix humboldtiana*	54	3
8505	raintree	*Samanea saman*	54	3
8509	common elderberry	*Sambucus nigra*	54	3
8529	wingleaf soapberry	*Sapindus saponaria*	54	3
8533	gumtree	*Sapium glandulosum*	54	3
8535	hinchahuevos	*Sapium laurifolium*	54	3
8536	milktree	*Sapium laurocerasus*	54	3
8546	amansa guapo	*Savia sessiliflora*	54	3
8554	Florida boxwood	*Schaefferia frutescens*	54	3
8556	guayabilla	*Samyda dodecandra*	54	3
8557	yuquilla	*Schefflera gleasonii*	54	3
8558	matchwood	*Schefflera morototonii*	54	3
8563	Brazilian peppertree	*Schinus terebinthifolius*	54	3
8565	Brazilian firetree	*Schizolobium parahybum*	54	3
8567	lac tree	*Schleichera oleosa*	54	3
8571	arana	*Schoepfia arenaria*	54	3
8572	white beefwood	*Schoepfia obovata*	54	3
8573	gulf graytwig	*Schoepfia schreberi*	54	3
8588	emperor's candlesticks	*Senna alata*	54	3
8589	flor de San Jose	*Senna atomaria*	54	3
8591	false sicklepod	*Senna multijuga*	54	3
8594	retama prieta	*Senna polyphylla*	54	3
8596	Siamese cassia	*Senna siamea*	54	3
8597	casia amarilla	*Senna spectabilis*	54	3
8599	Senna sulfurea	*Senna sulfurea*	54	3
8600	glossy shower	*Senna surattensis*	54	3
8605	vegetable hummingbird	*Sesbania grandiflora*	54	3
8611	espejuelo	*Sideroxylon cubense*	54	3
8613	breakbill	*Sideroxylon obovatum*	54	3
8614	Puerto Rico bully	*Sideroxylon portoricense*	54	3
8617	simarouba	*Simarouba spp.*	54	3
8619	aceitillo falso	*Simarouba tulae*	54	3
8620	hoja menuda	*Siphoneugena densiflora*	54	3
8622	bullwood	*Sloanea spp.*	54	3
8623	motillo	*Sloanea amygdalina*	54	3
8624	bullwood	*Sloanea berteriana*	54	3
8626	Solanum bahamense	*Solanum bahamense*	54	3
8627	mullein nightshade	*Solanum donianum*	54	3
8629	potatotree	*Solanum erianthum*	54	3
8632	forest nightshade	*Solanum nudum*	54	3
8633	cakalaka berry	*Solanum polygamum*	54	3
8634	tabacon aspero	*Solanum rugosum*	54	3
8636	turkey berry	*Solanum torvum*	54	3
8644	African tuliptree	*Spathodea campanulata*	54	3

8649	Spondias dulcis	*Spondias dulcis*	54	3
8650	yellow mombin	*Spondias mombin*	54	3
8652	purple mombin	*Spondias purpurea*	54	3
8654	cobana negra	*Stahlia monosperma*	54	3
8664	Panama tree	*Sterculia apetala*	54	3
8666	hazel sterculia	*Sterculia foetida*	54	3
8674	palo de jazmin	*Styrax portoricensis*	54	3
8676	bay cedar	*Suriana maritima*	54	3
8678	mahogany	*Swietenia spp.*	54	3
8679	Honduras mahogany	*Swietenia macrophylla*	54	3
8683	nispero cimarron	*Symplocos lanata*	54	3
8684	Martinique sweetleaf	*Symplocos martinicensis*	54	3
8685	aceitunilla	*Symplocos micrantha*	54	3
8701	Syzygium jambos	*Syzygium jambos*	54	3
8702	Malaysian apple	*Syzygium malaccense*	54	3
8709	roble amarillo	*Tabebuia chrysantha*	54	3
8710	primavera	*Tabebuia donnell-smithii*	54	3
8712	roble cimarron	*Tabebuia haemantha*	54	3
8713	white cedar	*Tabebuia heterophylla*	54	3
8715	roble de sierra	*Tabebuia rigida*	54	3
8716	pink trumpet-tree	*Tabebuia rosea*	54	3
8717	roble colorado	*Tabebuia schumanniana*	54	3
8720	milkwood	*Tabernaemontana citrifolia*	54	3
8727	Athel tamarisk	*Tamarix aphylla*	54	3
8743	yellow trumpetbush	*Tecoma stans*	54	3
8744	teak	*Tectona grandis*	54	3
8748	tropical almond	*Terminalia spp.*	54	3
8750	tropical almond	*Terminalia catappa*	54	3
8754	Ivory Coast almond	*Terminalia ivorensis*	54	3
8756	East Indian almond	*Terminalia myriocarpa*	54	3
8757	Peruvian almond	*Terminalia oblonga*	54	3
8761	superb terminalia	*Terminalia superba*	54	3
8762	saintedwood	*Ternstroemia heptasepala*	54	3
8763	palo colorado	*Ternstroemia luquillensis*	54	3
8764	copey vera	*Ternstroemia peduncularis*	54	3
8766	mamey de cura	*Ternstroemia stahlii*	54	3
8767	el yunque colorado	*Ternstroemia subsessilis*	53	3
8768	masa	*Tetragastris balsamifera*	53	3
8778	stinkingfish	*Tetrazygia angustifolia*	54	3
8780	Puerto Rico clover ash	*Tetrazygia biflora*	54	3
8781	krekre	*Tetrazygia elaeagnoides*	54	3
8783	cenizo	*Tetrazygia urbanii*	54	3
8784	cacao	*Theobroma cacao*	54	3
8786	maga	*Thespesia grandiflora*	54	3

8787	Portia tree	*Thespesia populnea*	54	3
8789	luckynut	*Thevetia peruviana*	54	3
8793	ceboruquillo	*Thouinia striata*	54	3
8794	Puerto Rico ceboruquillo	*Thouinia striata var. portoricensis*	54	3
8803	Brazilian glorytree	*Tibouchina granulosa*	54	3
8811	redcedar	*Toona spp.*	54	3
8812	Australian redcedar	*Toona ciliata*	54	3
8816	boje	*Torralbasia cuneifolia*	54	3
8825	cold withe	*Tournefortia filiflora*	54	3
8828	Lamarck's trema	*Trema lamarckianum*	54	3
8829	Jamaican nettletree	*Trema micranthum*	54	3
8833	broomstick	*Trichilia hirta*	54	3
8834	gaita	*Trichilia pallida*	54	3
8836	bariaco	*Trichilia triacantha*	54	3
8842	limeberry	*Triphasia trifolia*	54	3
8843	Triplaris spp.	*Triplaris spp.*	54	3
8844	ant tree	*Triplaris cumingiana*	54	3
8848	white ramoon	*Trophis racemosa*	54	3
8850	muttonwood	*Turpinia occidentalis*	54	3
8853	scratchbush	*Urera baccifera*	54	3
8854	flameberry	*Urera caracasana*	54	3
8855	ortiga	*Urera chlorocarpa*	54	3
8861	voa vanga	*Vangueria madagascariensis*	54	3
8871	lilac chastetree	*Vitex agnus-castus*	54	3
8873	higuerillo	*Vitex divaricata*	54	3
8881	Wallenia lamarckiana	*Wallenia lamarckiana*	54	3
8887	bastard briziletto	*Weinmannia pinnata*	54	3
8901	tallow wood	*Ximenia americana*	54	3
8906	mucha-gente	*Xylosma buxifolia*	54	3
8910	spiny logwood	*Xylosma pachyphylla*	54	3
8912	white logwood	*Xylosma schaefferioides*	54	3
8913	Schwaneck's logwood	*Xylosma schwaneckeana*	54	3
8916	aloe yucca	*Yucca aloifolia*	54	3
8918	moundlily yucca	*Yucca gloriosa*	54	3
8919	bluestem yucca	*Yucca guatemalensis*	54	3
8923	Maricao pricklyash	*Zanthoxylum bifoliolatum*	54	3
8924	prickly yellow	*Zanthoxylum caribaeum*	54	3
8928	West Indian satinwood	*Zanthoxylum flavum*	54	3
8931	white pricklyash	*Zanthoxylum martinicense*	54	3
8932	yellow prickle	*Zanthoxylum monophyllum*	54	3
8934	dotted pricklyash	*Zanthoxylum punctatum*	54	3
8935	niaragato	*Zanthoxylum spinifex*	54	3
8937	St. Thomas pricklyash	*Zanthoxylum thomasianum*	54	3
8938	Zapoteca portoricensis	*Zapoteca portoricensis*	54	3

8939	Indian jujube	*Ziziphus mauritiana*	54	3
8940	cacao rojo	*Ziziphus reticulata*	54	3
8941	soana	*Ziziphus rignonii*	54	3
8943	Taylor's jujube	*Ziziphus taylorii*	54	3

Appendix H. Pacific Tree Species Codes, Names, and Occurrences

Major groups (MAJGRP) are (1) pines, (2) other softwoods, (3) soft hardwoods, and (4) hard hardwoods. The species groups (SPGRPCD) can be found in appendix E.

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
0050	cypress	*Cupressus spp.*	52	2
0100	pine spp.	*Pinus spp.*	52	1
0299	Unknown dead conifer	*Tree evergreen*	52	2
0300	acacia spp.	*Acacia spp.*	54	3
0303	sweet acacia	*Acacia farnesiana*	54	3
0341	ailanthus	*Ailanthus altissima*	54	4
0350	alder spp.	*Alnus spp.*	54	3
0460	hackberry spp.	*Celtis spp.*	54	3
0510	eucalyptus spp.	*Eucalyptus spp.*	54	4
0511	Tasmanian bluegum	*Eucalyptus globulus*	54	4
0512	river redgum	*Eucalyptus camaldulensis*	54	4
0513	grand eucalyptus	*Eucalyptus grandis*	54	4
0514	swampmahogany	*Eucalyptus robusta*	54	4
0520	persimmon spp.	*Diospyros spp.*	54	4
0541	white ash	*Fraxinus americana*	54	4
0681	white mulberry	*Morus alba*	54	4
0712	paulownia, empress-tree	*Paulownia tomentosa*	54	3
0715	Maytenus palauica	*Maytenus palauica*	54	3
0718	kesiamel	*Osmoxylon truncatum*	54	3
0720	bay spp.	*Persea spp.*	54	3
0755	mesquite spp.	*Prosopis spp.*	54	4
0764	peach	*Prunus persica*	54	3
0800	oak spp.	*Quercus spp.*	54	4
0855	sheoak spp.	*Casuarina spp.*	52	3
0856	gray sheoak	*Casuarina glauca*	52	3
0858	camphortree	*Cinnamomum camphora*	54	3
0860	citrus spp.	*Citrus spp.*	54	3
0865	largeleaf geigertree	*Cordia sebestena*	54	3
0885	mango	*Mangifera indica*	54	3
0887	fishpoison tree	*Piscidia piscipula*	54	3
0888	octopus tree, schefflera	*Schefflera actinophylla*	54	3
0896	Java plum	*Syzygium cumini*	54	3
0897	tamarind	*Tamarindus indica*	54	3
0908	coconut palm	*Cocos nucifera*	53	3
0940	West Indian mahogany	*Swietenia mahagoni*	54	4
0974	Siberian elm	*Ulmus pumila*	54	3
0987	buttonwood-mangrove	*Conocarpus erectus*	54	4
0989	American mangrove	*Rhizophora mangle*	54	4
0992	melaleuca	*Melaleuca quinquenervia*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
0993	chinaberry	*Melia azedarach*	54	4
0994	Chinese tallowtree	*Triadica sebifera*	54	4
0998	unknown dead hardwood	*Tree broadleaf*	54	3
0999	other or unknown live tree	*Tree unknown*	52	3
6002	mulga	*Acacia aneura*	54	3
6003	auri	*Acacia auriculiformis*	54	3
6004	small Philippine acacia	*Acacia confusa*	54	3
6006	koa	*Acacia koa*	54	3
6007	koaoha	*Acacia koaia*	54	3
6010	black wattle	*Acacia mearnsii*	54	3
6011	blackwood	*Acacia melanoxylon*	54	3
6014	South Wales wattle	*Acacia parramattensis*	54	3
6028	red beadtree	*Adenanthera pavonina*	54	3
6029	beadtree	*Adenanthera spp.*	54	3
6042	Titimel	*Aglaia mariannensis*	54	3
6043	mesecheues	*Aglaia palauensis*	54	3
6044	karasyu, marasau	*Aglaia ponapensis*	54	3
6046	laga ali	*Aglaia samoensis*	54	3
6047	Aglaia	*Aglaia spp.*	54	3
6048	Olomea	*Aidia cochinchinensis*	54	3
6049	Aidia racemosa	*Aidia racemosa*	54	3
6051	ailanthus	*Ailanthus spp.*	54	3
6057	Chinese albizia	*Albizia chinensis*	54	3
6058	ukall ra ngebard	*Albizia falcataria*	54	3
6059	woman's tongue	*Albizia lebbeck*	54	3
6061	ukall ra ngebard	*Albizia retusa*	54	3
6062	whiteflower albizia	*Albizia saponaria*	54	3
6063	albizia	*Albizia spp.*	54	3
6069	Hawaii alectryon	*Alectryon micrococcus*	54	3
6073	alectryon	*Alectryon spp.*	54	3
6075	Indian walnut	*Aleurites moluccana*	54	3
6077	aleurites	*Aleurites spp.*	54	3
6078	lumbang	*Aleurites trisperma*	54	3
6083	Allophylus	*Allophylus spp.*	54	3
6084	chebeludes	*Allophylus ternatus*	54	3
6085	ebeludes, chebeludes	*Allophylus timorensis*	54	3
6086	Nepal alder	*Alnus nepalensis*	54	3
6088	chelebiob, elebiong	*Alphitonia carolinensis*	54	3
6089	Hawaii kauilatree	*Alphitonia ponderosa*	54	3
6090	Alphitonia	*Alphitonia spp.*	54	3
6091	toi	*Alphitonia zizyphoides*	54	3
6095	deviltree	*Alstonia macrophylla*	54	3
6096	Alstonia pacifica	*Alstonia pacifica*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6097	alstonia	*Alstonia spp.*	54	3
6107	cashew	*Anacardium occidentale*	54	3
6109	Anacolosa insularis	*Anacolosa insularis*	54	3
6118	dermarm	*Angiopteris evecta*	54	3
6124	Annona cherimola	*Annona cherimola*	54	3
6128	soursop	*Annona muricata*	54	3
6129	custard apple	*Annona reticulata*	54	3
6130	Annona	*Annona spp.*	54	3
6131	sugar apple	*Annona squamosa*	54	3
6135	Kapua china laurel	*Antidesma kapuae*	54	3
6137	Antidesma bunius	*Antidesma bunius*	54	3
6138	Antidesma kusaiense	*Antidesma kusaiense*	54	3
6139	ha a	*Antidesma platyphyllum*	54	3
6142	Antidesma ponapense	*Antidesma ponapense*	54	3
6143	hame	*Antidesma pulvinatum*	54	3
6144	Antidesma sphaerocarpum	*Antidesma sphaerocarpum*	54	3
6145	chinalaurel	*Antidesma spp.*	54	3
6148	Antirhea inconspicua	*Antirhea inconspicua*	54	3
6154	parana pine	*Araucaria angustifolia*	51	3
6155	New Caledonia pine	*Araucaria columnaris*	51	1
6156	Norfolk Island Pine	*Araucaria excelsa*	51	1
6157	Norfolk Island pine	*Araucaria heterophylla*	51	3
6158	Araucaria	*Araucaria spp.*	51	3
6159	Alexandra palm	*Archontophoenix alexandrae*	53	3
6161	shoebutton	*Ardisia elliptica*	54	3
6166	marlberry	*Ardisia spp.*	54	3
6167	betelnut	*Areca catechu*	54	3
6169	cabo-negro	*Arenga pinnata*	54	3
6171	breadfruit	*Artocarpus altilis*	54	3
6173	Artocarpus heterophyllus	*Artocarpus heterophyllus*	54	3
6175	dugdug, Marianas breadfruit	*Artocarpus mariannensis*	54	3
6176	Artocarpus nobilis	*Artocarpus nobilis*	54	3
6177	Marang	*Artocarpus odoratissimus*	54	3
6178	meduu	*Artocarpus spp.*	54	3
6179	taputoi	*Arytera brackenridgei*	54	3
6181	afia	*Ascarina diffusa*	54	3
6185	Astronidium navigatorum	*Astronidium navigatorum*	54	3
6186	meskui	*Astronidium palauense*	54	3
6187	Astronidium pickeringii	*Astronidium pickeringii*	54	3
6188	Astronidium samoense	*Astronidium samoense*	54	3
6189	Astronidium	*Astronidium spp.*	54	3
6190	Astronidium subcordata	*Astronidium subcordata*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6193	ifi ifi	*Atuna racemosa*	54	3
6197	Bilimbi	*Averrhoa bilimbi*	54	3
6198	carambola	*Averrhoa carambola*	54	3
6199	Averrhoa	*Averrhoa spp.*	54	3
6200	biut	*Avicennia alba*	54	3
6203	Avicennia marina	*Avicennia marina*	54	3
6205	Avicennia	*Avicennia spp.*	54	3
6208	Saitamu	*Baccaurea taitensis*	54	3
6213	ralm	*Badusa palauensis*	54	3
6215	bamboo	*Bambusa spp.*	54	3
6216	common bamboo	*Bambusa vulgaris*	54	3
6220	sea putat	*Barringtonia asiatica*	54	3
6221	langaasag	*Barringtonia racemosa*	54	3
6222	falaga	*Barringtonia samoensis*	54	3
6223	Barringtonia	*Barringtonia spp.*	54	3
6225	Bauhinia binata	*Bauhinia binata*	54	3
6226	Napoleon's plume	*Bauhinia monandra*	54	3
6230	bauhinia	*Bauhinia spp.*	54	3
6236	Javanese bishopwood	*Bischofia javanica*	54	3
6237	bishopwood	*Bischofia spp.*	54	3
6238	lipsticktree	*Bixa orellana*	54	3
6239	bixa	*Bixa spp.*	54	3
6242	akupa	*Bobea brevipes*	54	3
6243	ahakea lau nui	*Bobea elatior*	54	3
6244	Hawaii dogweed	*Bobea sandwicensis*	54	3
6245	ahakea	*Bobea spp.*	54	3
6246	ahakea	*Bobea timonioides*	54	3
6247	parrotweed	*Bocconia frutescens*	54	3
6248	bocconia	*Bocconia spp.*	54	3
6250	virgata	*Boehmeria virgata*	54	3
6260	kanawao	*Broussaisia arguta*	54	3
6262	paper mulberry	*Broussonetia papyrifera*	54	3
6264	angels-trumpet	*Brugmansia candida*	54	3
6267	smallflower bruguiera	*Bruguiera parviflora*	54	3
6268	Oriental mangrove	*Bruguiera sexangula*	54	3
6269	bruguiera	*Bruguiera spp.*	54	3
6277	omail	*Buchanania engleriana*	54	3
6278	gasu	*Buchanania merrillii*	54	3
6279	omail, deuachel	*Buchanania palawensis*	54	3
6280	Buchanania	*Buchanania spp.*	54	3
6286	dogtail	*Buddleja asiatica*	54	3
6299	Burckella richii	*Burckella richii*	54	3
6318	uhiuhi	*Caesalpinia kavaiensis*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6320	sappanwood	*Caesalpinia sappan*	54	3
6341	Alexandrian laurel	*Calophyllum inophyllum*	54	3
6342	tamanu	*Calophyllum neo-ebudicum*	54	3
6343	chesemolech	*Calophyllum pelewense*	54	3
6344	olebtaches, chesemolech	*Calophyllum soulattri*	54	3
6345	calophyllum	*Calophyllum spp.*	54	3
6346	roostertree	*Calotropis procera*	54	3
6347	calotropis	*Calotropis spp.*	54	3
6366	kelela charm, kiu	*Campnosperma brevipetiolatum*	54	3
6370	ilang-ilang	*Cananga odorata*	54	3
6372	mafoa	*Canarium mafoa*	54	3
6373	mesecheues	*Canarium hirsutum*	54	3
6374	lukerr	*Canarium indicum*	54	3
6375	Pili Nut	*Canarium ovatum*	54	3
6377	Canarium	*Canarium spp.*	54	3
6378	maali	*Canarium vitiense*	54	3
6381	Olasina	*Psydrax merrillii*	54	3
6395	papaya	*Carica papaya*	53	3
6396	papaya	*Carica spp.*	53	3
6397	scorpionbush	*Carmona retusa*	54	3
6398	scorpionbush	*Carmona spp.*	54	3
6399	fish tail palm	*Caryota mitis*	53	3
6400	Caryota	*Caryota spp.*	53	3
6401	fishtail palm	*Caryota urens*	53	3
6405	keuert	*Casearia cauliflora*	54	3
6408	Casearia	*Casearia spp.*	54	3
6415	golden shower	*Cassia fistula*	54	3
6417	pink shower	*Cassia grandis*	54	3
6418	apple blossom	*Cassia javanica*	54	3
6420	kassod tree	*Cassia siamea*	54	3
6422	Cassia	*Cassia spp.*	54	3
6430	Panama rubbertree	*Castilla elastica*	54	3
6433	river sheoak	*Casuarina cunninghamiana*	52	3
6434	beach sheoak	*Casuarina equisetifolia*	52	3
6437	gagu, australian pine	*Casuarina litorea*	52	1
6439	Haitian catalpa	*Catalpa longissima*	54	3
6441	trumpet tree	*Cecropia obtusifolia*	54	3
6444	pumpwood	*Cecropia spp.*	54	3
6449	kapoktree	*Ceiba pentandra*	54	3
6452	Celtis paniculata	*Celtis paniculata*	54	3
6459	chuti	*Cerbera dilatata*	54	3
6460	emeridech	*Cerbera floribunda*	54	3
6461	leva	*Cerbera manghas*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6463	Cerbera spp	*Cerbera spp.*	54	3
6469	Cereus hildmannianus	*Cereus hildmannianus*	52	3
6470	sweetpotato cactus	*Cereus spp.*	52	3
6472	biut	*Ceriops tagal*	54	3
6473	orange jessamine	*Cestrum aurantiacum*	54	3
6474	day jessamine	*Cestrum diurnum*	54	3
6477	night jessamine	*Cestrum nocturnum*	54	3
6478	jessamine	*Cestrum spp.*	54	3
6482	koko	*Chamaesyce atrococca*	54	3
6483	ekoko	*Chamaesyce celastroides*	54	3
6492	Herbsts sandmat	*Chamaesyce herbstii*	54	3
6493	kokomalei	*Chamaesyce kuwaleana*	54	3
6494	alpine sandmat	*Chamaesyce olowaluana*	54	3
6495	Koolau Range sandmat	*Chamaesyce rockii*	54	3
6496	sandmat	*Chamaesyce spp.*	54	3
6497	Napali coast papala	*Charpentiera densiflora*	54	3
6498	ellipticleaf papala	*Charpentiera elliptica*	54	3
6499	broadleaf papala	*Charpentiera obovata*	54	3
6500	Koolau Range papala	*Charpentiera ovata*	54	3
6503	papala	*Charpentiera spp.*	54	3
6504	Waianae Range papala	*Charpentiera tomentosa*	54	3
6507	Domins club	*Cheirodendron dominii*	54	3
6508	Fauries club	*Cheirodendron fauriei*	54	3
6509	olapa	*Cheirodendron forbesii*	54	3
6510	lapalapa	*Cheirodendron platyphyllum*	54	3
6513	cheirodendron	*Cheirodendron spp.*	54	3
6514	olapalapa	*Cheirodendron trigynum*	54	3
6517	alaweo	*Chenopodium oahuense*	54	3
6518	goosefoot	*Chenopodium spp.*	54	3
6525	vitiensis	*Chionanthus vitiensis*	54	3
6541	star apple	*Chrysophyllum cainito*	54	3
6542	satinleaf	*Chrysophyllum oliviforme*	54	3
6545	Hawaiian tree fern	*Cibotium heleniae*	54	3
6546	Chamissos manfern	*Cibotium chamissoi*	54	3
6547	hapuu	*Cibotium glaucum*	54	3
6548	hapuu li	*Cibotium menziesii*	54	3
6549	manfern	*Cibotium spp.*	54	3
6552	quinine	*Cinchona pubescens*	54	3
6553	cinchona	*Cinchona spp.*	54	3
6555	Padang cassia	*Cinnamomum burmannii*	54	3
6557	ochod	*Cinnamomum carolinense*	54	3
6561	ochod	*Cinnamomum pedatinervium*	54	3
6562	matieu	*Cinnamomum sessilifolium*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6563	cinnamon	*Cinnamomum spp.*	54	3
6564	cinnamon	*Cinnamomum verum*	54	3
6565	juniper berry	*Citharexylum caudatum*	54	3
6567	spiny fiddlewood	*Citharexylum spinosum*	54	3
6568	fiddlewood	*Citharexylum spp.*	54	3
6570	samoensis	*Citronella samoensis*	54	3
6572	Lime (Tipolo)	*Citrus aurantifolia*	54	3
6574	sour orange	*Citrus xaurantium*	54	3
6575	lemon	*Citrus xlimon*	54	3
6577	sweet orange	*Citrus xsinensis*	54	3
6578	grapefruit, kahet magas	*Citrus grandis*	54	3
6579	limon china	*Citrus hystrix*	54	3
6580	kahet, wild orange	*Citrus macroptera*	54	3
6581	Citrus maxima	*Citrus maxima*	54	3
6582	Citrus medica	*Citrus medica*	54	3
6583	Calamondin, kingkang	*Citrus mitis*	54	3
6584	Citrus reticulata	*Citrus reticulata*	54	3
6586	koee	*Claoxylon carolinianum*	54	3
6588	Claoxylon fallax	*Claoxylon fallax*	54	3
6589	Claoxylon longiracemosum	*Claoxylon longiracemosum*	54	3
6590	katteknau, katot	*Claoxylon marianum*	54	3
6591	poola	*Claoxylon sandwicense*	54	3
6592	claoxylon	*Claoxylon spp.*	54	3
6593	Cleistanthus carolinianus	*Cleistanthus carolinianus*	54	3
6594	Cleistanthus insularis	*Cleistanthus insularis*	54	3
6595	Cleistanthus	*Cleistanthus spp.*	54	3
6596	oha wai nui Clermontia	*Clermontia leptoclada*	54	3
6597	oha wai nui	*Clermontia arborescens*	54	3
6601	Kauai clermontia	*Clermontia clermontioides*	54	3
6604	Kohala Mountain clermontia	*Clermontia drepanomorpha*	54	3
6605	haha aiakamanu	*Clermontia fauriei*	54	3
6606	bog clermontia	*Clermontia grandiflora*	54	3
6610	oha kepau	*Clermontia hawaiiensis*	54	3
6611	forest clermontia	*Clermontia kakeana*	54	3
6612	Waipio Valley clermontia	*Clermontia kohalae*	54	3
6613	hillside clermontia	*Clermontia lindseyana*	54	3
6614	Maui clermontia	*Clermontia micrantha*	54	3
6615	Mauna Loa clermontia	*Clermontia montis-loa*	54	3
6616	Oahu clermontia	*Clermontia oblongifolia*	54	3
6620	Wailai Pali clermontia	*Clermontia pallida*	54	3
6621	smallflower clermontia	*Clermontia parvifolia*	54	3
6622	pele clermontia	*Clermontia peleana*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6625	Waioiani clermontia	*Clermontia persicifolia*	54	3
6626	Hamakua clermontia	*Clermontia pyrularia*	54	3
6627	Clermontia singuliflora	*Clermontia singuliflora*	54	3
6628	clermontia	*Clermontia spp.*	54	3
6629	Haleakala clermontia	*Clermontia tuberculata*	54	3
6630	swampforest clermontia	*Clermontia waimeae*	54	3
6632	stickbush	*Clerodendrum chinense*	54	3
6633	Natal glorybower	*Clerodendrum glabrum*	54	3
6634	turks turbin	*Clerodendrum indicum*	54	3
6635	velvetleaf glorybower	*Clerodendrum macrostegium*	54	3
6636	glorybower	*Clerodendrum spp.*	54	3
6651	Scotch attorney	*Clusia rosea*	54	3
6652	attorney	*Clusia spp.*	54	3
6670	seagrape	*Coccoloba uvifera*	54	3
6681	coconut palm	*Cocos spp.*	53	3
6684	Arabian coffee	*Coffea arabica*	54	3
6686	Coffea liberica	*Coffea liberica*	54	3
6687	coffee	*Coffea spp.*	54	3
6691	uab, chuchab	*Colona scabra*	54	3
6694	Asian nakedwood	*Colubrina asiatica*	54	3
6697	kauila	*Colubrina oppositifolia*	54	3
6699	nakedwood	*Colubrina spp.*	54	3
6702	ochaol	*Combretum tetralophum*	54	3
6703	Mao	*Commersonia bartramia*	54	3
6709	mangrove	*Conocarpus spp.*	54	3
6716	forest mirrorplant	*Coprosma foliosa*	54	3
6717	koi	*Coprosma kauensis*	54	3
6718	Oahu mirrorplant	*Coprosma longifolia*	54	3
6719	alpine mirrorplant	*Coprosma montana*	54	3
6720	Maui mirrorplant	*Coprosma ochracea*	54	3
6721	pubescent mirrorplant	*Coprosma pubens*	54	3
6722	woodland mirrorplant	*Coprosma rhynchocarpa*	54	3
6724	mirrorplant	*Coprosma spp.*	54	3
6726	olena	*Coprosma waimeae*	54	3
6729	Tou	*Cordia aspera*	54	3
6731	red manjack	*Cordia collococca*	54	3
6733	fragrant manjack	*Cordia dichotoma*	54	3
6736	Cordia micronesica	*Cordia micronesica*	54	3
6741	cordia	*Cordia spp.*	54	3
6742	kou	*Cordia subcordata*	54	3
6744	tiplant	*Cordyline fruticosa*	53	3
6745	cordyline	*Cordyline spp.*	53	3
6749	redgum	*Corymbia calophylla*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6750	Corymbia citriodora	*Corymbia citriodora*	54	3
6751	redflower gum	*Corymbia ficifolia*	54	3
6752	red bloodwood	*Corymbia gummifera*	54	3
6754	karaka nut	*Corynocarpus laevigatus*	54	3
6755	corynocarpus	*Corynocarpus spp.*	54	3
6756	cannonball tree	*Couroupita guianensis*	54	3
6758	sacred garlic pear	*Crateva religiosa*	54	3
6760	houka, calabash	*Crescentia alata*	54	3
6769	Saitamu	*Crossostylis biflora*	54	3
6771	longbeak rattlebox	*Crotalaria longirostrata*	54	3
6778	Cryptocarya oreophila	*Cryptocarya oreophila*	54	3
6779	laulilii	*Cryptocarya elegans*	54	3
6781	holio	*Cryptocarya mannii*	54	3
6783	cryptocarya	*Cryptocarya spp.*	54	3
6784	laulilii	*Cryptocarya turbinata*	54	3
6786	Japanese cedar	*Cryptomeria japonica*	51	2
6787	Japanese cedar	*Cryptomeria spp.*	51	3
6795	cedar-of-Goa	*Cupressus lusitanica*	52	2
6796	Italian cypress	*Cupressus sempervirens*	52	2
6800	Haleakala cyanea	*Cyanea aculeatiflora*	53	3
6801	palmtree cyanea	*Cyanea arborea*	53	3
6802	Kauai cyanea	*Cyanea fissa*	53	3
6805	Degeners cyanea	*Cyanea floribunda*	53	3
6806	Kilauea Mauna cyanea	*Cyanea giffardii*	53	3
6807	wetforest cyanea	*Cyanea hamatiflora*	53	3
6810	Oahu cyanea	*Cyanea hardyi*	53	3
6811	prickly cyanea	*Cyanea horrida*	53	3
6812	Limahuli Valley cyanea	*Cyanea kuhihewa*	53	3
6813	Kunths cyanea	*Cyanea kunthiana*	53	3
6814	giant kokee cyanea	*Cyanea leptostegia*	53	3
6815	purple cyanea	*Cyanea macrostegia*	53	3
6818	Marks cyanea	*Cyanea marksii*	53	3
6819	hairy cyanea	*Cyanea pilosa*	53	3
6822	pohaku cyanea	*Cyanea pohaku*	53	3
6823	Molokai cyanea	*Cyanea procera*	53	3
6824	manyfruit cyanea	*Cyanea pycnocarpa*	53	3
6825	oakleaf cyanea	*Cyanea quercifolia*	53	3
6826	plateau delissea	*Cyanea rivularis*	53	3
6827	pua kala	*Cyanea solenocalyx*	53	3
6828	cyanea	*Cyanea spp.*	53	3
6829	Kaiholena cyanea	*Cyanea stictophylla*	53	3
6830	Mt. Kaala cyanea	*Cyanea superba*	53	3
6833	aku aku	*Cyanea tritomantha*	53	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6837	Coopers cyathea	*Cyathea cooperi*	53	3
6838	olioli	*Cyathea decurrens*	53	3
6840	olioli	*Cyathea lunulata*	53	3
6841	olioli	*Cyathea medullaris*	53	3
6842	kattar	*Cyathea nigricans*	53	3
6844	kattar	*Cyathea ponapeana*	53	3
6847	treefern	*Cyathea spp.*	53	3
6849	olioli	*Cyathea truncata*	53	3
6852	queen sago	*Cycas circinalis*	53	3
6853	remiang	*Cycas revoluta*	53	3
6854	Cycas	*Cycas spp.*	53	3
6855	ola	*Cyclophyllum barbatum*	54	3
6858	gulos	*Cynometra ramiflora*	54	3
6860	tree-tomato	*Cyphomandra betacea*	54	3
6863	cyrtanda	*Cyrtandra pulchella*	54	4
6864	Cyrtandra	*Cyrtandra ramosissima*	54	3
6865	forest cyrtandra	*Cyrtandra giffardii*	54	3
6866	cyrtandra	*Cyrtandra spp.*	54	3
6875	Hawaii delissea	*Delissea fallax*	54	3
6876	cutleaf delissea	*Delissea laciniata*	54	3
6877	Niihau delissea	*Delissea niihauensis*	54	3
6880	smallflower delissea	*Delissea parviflora*	54	3
6881	delissea	*Delissea spp.*	54	3
6882	leechleaf delissea	*Delissea undulata*	54	3
6883	royal poinciana	*Delonix regia*	54	3
6884	delonix	*Delonix spp.*	54	3
6885	salato	*Dendrocnide harveyi*	54	3
6886	kahtat	*Dendrocnide latifolia*	54	3
6887	Dendrocnide	*Dendrocnide spp.*	54	3
6891	redpalm	*Dictyosperma album*	53	3
6898	Shrubby dillenia	*Dillenia suffruticosa*	54	3
6900	mabolo	*Diospyros blancoi*	54	3
6902	Mabolo	*Diospyros discolor*	54	3
6903	Black sapote	*Diospyros ebenaster*	54	3
6904	anume	*Diospyros elliptica*	54	3
6905	Diospyros ferrea	*Diospyros ferrea*	54	3
6906	elama	*Diospyros hillebrandii*	54	3
6907	persimmon	*Diospyros kaki*	54	3
6910	auauli	*Diospyros samoensis*	54	3
6911	lama	*Diospyros sandwicensis*	54	3
6921	otot	*Discocalyx ponapensis*	54	3
6927	Florida hopbush	*Dodonaea viscosa*	54	3
6928	rru	*Dolichandrone spathacea*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
6930	Ceylon gooseberry	*Dovyalis hebecarpa*	54	3
6933	Dracaena multiflora	*Dracaena multiflora*	53	3
6941	kevert	*Drypetes nitida*	54	3
6942	Drypetes	*Drypetes spp.*	54	3
6943	none	*Drypetes vitiensis*	54	3
6944	Dubautia	*Dubautia demissifolia*	54	3
6945	Dubautia	*Dubautia fallax*	54	3
6946	Dubautia	*Dubautia montana*	54	3
6947	Mauna Kea dubautia	*Dubautia arborea*	54	3
6948	forest dubautia	*Dubautia knudsenii*	54	3
6952	Kauai dubautia	*Dubautia microcephala*	54	3
6953	plantainleaf dubautia	*Dubautia plantaginea*	54	3
6957	netvein dubautia	*Dubautia reticulata*	54	3
6958	dubautia	*Dubautia spp.*	54	3
6961	golden dewdrops	*Duranta erecta*	54	3
6965	Durian	*Durio zibethinus*	54	3
6966	Dypsis lutescens	*Dypsis lutescens*	53	3
6968	maota mea	*Dysoxylum huntii*	54	3
6969	maota	*Dysoxylum maota*	54	3
6970	mamala	*Dysoxylum samoense*	54	3
6971	Dysoxylum	*Dysoxylum spp.*	54	3
6973	oil nut palm	*Elaeis guineensis*	53	3
6975	kalia	*Elaeocarpus bifidus*	54	3
6976	syatak	*Elaeocarpus carolinensis*	54	3
6977	`a`mati`e	*Elaeocarpus floridanus*	54	3
6978	Elaeocarpus graeffei	*Elaeocarpus graeffei*	54	3
6979	sapatua	*Elaeocarpus grandis*	54	3
6980	joga	*Elaeocarpus joga*	54	3
6981	Elaeocarpus kerstingianus	*Elaeocarpus kerstingianus*	54	3
6982	maratte, opop	*Elaeocarpus kusanoi*	54	3
6983	Elaeocarpus	*Elaeocarpus spp.*	54	3
6984	aamatie	*Elaeocarpus tonganus*	54	3
6985	Elaeocarpus	*Elaeocarpus ulianus*	54	3
6990	taputoi	*Elattostachys falcata*	54	3
6992	utuutu	*Eleocharis dulcis*	54	3
6994	elaeocarpa	*Endiandra elaeocarpa*	54	3
6996	monkeysoap	*Enterolobium cyclocarpum*	54	3
6998	loquat	*Eriobotrya japonica*	54	3
6999	loquat	*Eriobotrya spp.*	54	3
7008	bucayo	*Erythrina fusca*	54	3
7012	wili wili	*Erythrina sandwicensis*	54	3
7013	erythrina	*Erythrina spp.*	54	3
7014	gatae palagi	*Erythrina subumbrans*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7016	tiger's claw	*Erythrina variegata var. orientalis*	54	3
7017	acuminatissimum	*Erythrospermum acuminatissimum*	54	3
7025	southern mahogany	*Eucalyptus botryoides*	54	3
7026	applebox	*Eucalyptus bridgesiana*	54	3
7028	argyle apple	*Eucalyptus cinerea*	54	3
7030	sugargum	*Eucalyptus cladocalyx*	54	3
7031	yate	*Eucalyptus cornuta*	54	3
7032	narrowleaf red ironbark	*Eucalyptus crebra*	54	3
7033	roundleaf gum	*Eucalyptus deanei*	54	3
7034	Indonesian gum	*Eucalyptus deglupta*	54	3
7038	tuart	*Eucalyptus gomphocephala*	54	3
7039	mountain graygum	*Eucalyptus goniocalyx*	54	3
7041	white box	*Eucalyptus hemiphloia*	54	3
7044	jarrah	*Eucalyptus marginata*	54	3
7045	Australian tallowwood	*Eucalyptus microcorys*	54	3
7046	gray ironbark	*Eucalyptus paniculata*	54	3
7047	blackbutt	*Eucalyptus pilularis*	54	3
7048	black ironbox	*Eucalyptus raveretiana*	54	3
7049	redmahogany	*Eucalyptus resinifera*	54	3
7051	Western Australian floodedgum	*Eucalyptus rudis*	54	3
7052	black peppermint	*Eucalyptus salicifolia*	54	3
7053	Sydney bluegum	*Eucalyptus saligna*	54	3
7054	red ironbark	*Eucalyptus sideroxylon*	54	3
7056	forest redgum	*Eucalyptus tereticornis*	54	3
7057	manna gum	*Eucalyptus viminalis*	54	3
7059	edebsachel, chedebsachel	*Eugenia aquea*	54	3
7065	cloves	*Eugenia caryophyllus*	54	3
7078	macupa, wax apple	*Eugenia javanica*	54	3
7079	nioi	*Eugenia koolauensis*	54	3
7082	makupa, malay apple	*Eugenia malaccensis*	54	3
7086	Eugenia nitida	*Eugenia nitida*	54	3
7087	orenged	*Eugenia palauensis*	54	3
7088	agatelang	*Eugenia palumbis*	54	3
7091	mountain stopper	*Eugenia reinwardtiana*	54	3
7096	stopper	*Eugenia spp.*	54	3
7099	luluhut	*Eugenia stelechantha*	54	3
7101	rebotel	*Eugenia suzukii*	54	3
7102	atoto	*Eugenia thompsonii*	54	3
7104	Surinam cherry	*Eugenia uniflora*	54	3
7110	Kauai spurge	*Euphorbia haeleeleana*	54	3
7112	Indian spurgetree	*Euphorbia neriifolia*	54	3
7114	poinsettia	*Euphorbia pulcherrima*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7115	spurge	*Euphorbia spp.*	54	3
7116	Indiantree spurge	*Euphorbia tirucalli*	54	3
7117	Longan	*Euphoria longana*	54	3
7119	anini	*Eurya sandwicensis*	54	3
7120	eurya	*Eurya spp.*	54	3
7123	Euodia hortensis	*Euodia hortensis*	54	3
7124	kertub	*Euodia nitida*	54	3
7125	beror	*Euodia palawensis*	54	3
7126	Euodia ponapensis	*Euodia ponapensis*	54	3
7127	Euodia	*Euodia spp.*	54	3
7128	Euodia trichantha	*Euodia trichantha*	54	3
7129	blinding tree	*Excoecaria agallocha*	54	3
7131	hulumoa	*Exocarpos gaudichaudii*	54	3
7132	exocarpos	*Exocarpos spp.*	54	3
7133	kotop	*Exorrhiza ponapensis*	54	3
7141	pualulu	*Fagraea beteroana*	54	3
7142	ksid	*Fagraea ksid*	54	3
7143	Fagraea	*Fagraea spp.*	54	3
7144	peacocksplume	*Falcataria moluccana*	54	3
7145	peacocksplume	*Falcataria spp.*	54	3
7151	edible fig	*Ficus carica*	54	3
7155	Indian rubberplant	*Ficus elastica*	54	3
7156	mati	*Ficus godeffroyi*	54	3
7160	Chinese banyan	*Ficus microcarpa*	54	3
7162	tibig	*Ficus nota*	54	3
7163	aoa	*Ficus obliqua*	54	3
7165	aoa	*Ficus prolixa*	54	3
7167	Port Jackson fig	*Ficus rubiginosa*	54	3
7168	lulk, banyan	*Ficus saffordii*	54	3
7169	mati vao	*Ficus scabra*	54	3
7171	fig	*Ficus spp.*	54	3
7175	Chinese banyan	*Ficus thonningii*	54	3
7176	mati	*Ficus tinctoria*	54	3
7178	mati	*Ficus uniauriculata*	54	3
7179	higo	*Ficus virens*	54	3
7180	Finschia chloroxantha	*Finschia chloroxantha*	54	3
7182	burrdaisytree	*Fitchia speciosa*	54	3
7186	filimoto	*Flacourtia rukam*	54	3
7188	Queensland maple	*Flindersia brayleyana*	54	3
7191	poumuli	*Flueggea flexuosa*	54	3
7192	mehamehame	*Flueggea neowawraea*	54	3
7193	bushweed	*Flueggea spp.*	54	3
7200	California buckthorn	*Frangula californica*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7206	shamel ash	*Fraxinus uhdei*	54	3
7207	Bolivian fuchsia	*Fuchsia boliviana*	54	3
7208	shrubby fuchsia	*Fuchsia paniculata*	54	3
7209	fuchsia	*Fuchsia spp.*	54	3
7210	silkrubber	*Funtumia elastica*	54	3
7211	avocado	*Persea americana*	54	3
7214	mangosteen	*Garcinia mangostana*	54	3
7215	tilol	*Garcinia matsudai*	54	3
7216	none	*Garcinia myrtifolia*	54	3
7217	konpuil	*Garcinia ponapensis*	54	3
7219	tilol	*Garcinia rumiyo*	54	3
7221	Garcinia	*Garcinia spp.*	54	3
7224	forest gardenia	*Gardenia brighamii*	54	3
7225	Oahu gardenia	*Gardenia mannii*	54	3
7226	Remys gardenia	*Gardenia remyi*	54	3
7227	gardenia	*Gardenia spp.*	54	3
7228	Tahitian gardenia	*Gardenia taitensis*	54	3
7229	manuai vivao	*Garuga floribunda*	54	3
7233	taipoipo	*Geniostoma rupestre*	54	3
7241	Gironniera celtidifolia	*Gironniera celtidifolia*	54	3
7245	quickstick	*Gliricidia sepium*	54	3
7247	masame	*Glochidion cuspidatum*	54	3
7248	Glochidion marianum	*Glochidion marianum*	54	3
7249	masame	*Glochidion ramiflorum*	54	3
7250	Glochidion	*Glochidion spp.*	54	3
7251	belau	*Gmelina elliptica*	54	3
7252	blacheos	*Gmelina palawensis*	54	3
7253	Gmelina	*Gmelina spp.*	54	3
7254	Gnetum gnemon	*Gnetum gnemon*	54	3
7260	Goniothalamus carolinensis	*Goniothalamus carolinensis*	54	3
7262	Creole cotton	*Gossypium barbadense*	54	3
7264	Gossypium hirsutum	*Gossypium hirsutum*	54	3
7272	kahiliflower	*Grevillea banksii*	54	3
7273	silkoak	*Grevillea robusta*	54	3
7274	grevillea	*Grevillea spp.*	54	3
7275	fau ui	*Grewia crenata*	54	3
7279	lignum-vitae	*Guajacum officinale*	54	3
7282	paipai	*Guamia mariannae*	54	3
7307	puapua	*Guettarda speciosa*	54	3
7311	rhoifolia	*Guioa rhoifolia*	54	3
7312	Guioa	*Guioa spp.*	54	3
7313	bochela uchererak, uch	*Gulubia palauensis*	54	3
7319	vilivili	*Gyrocarpus americanus*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7321	bloodwoodtree	*Haematoxylum campechianum*	54	3
7332	Haplolobus floribundus	*Haplolobus floribundus*	54	3
7334	fa`aili	*Harpullia arborea*	54	3
7338	denticulata	*Hedycarya denticulata*	54	3
7340	Hedycarya	*Hedycarya spp.*	54	3
7343	Fosbergs starviolet	*Hedyotis fosbergii*	54	3
7344	manono	*Hedyotis hillebrandii*	54	3
7345	starviolet	*Hedyotis spp.*	54	3
7346	variable starviolet	*Hedyotis terminalis*	54	3
7349	white moho	*Heliocarpus popayanensis*	54	3
7350	heliocarpus	*Heliocarpus spp.*	54	3
7359	ufa	*Heritiera littoralis*	54	3
7360	ufa halemtano	*Heritiera longipetiolata*	54	3
7362	Heritiera	*Heritiera spp.*	54	3
7363	pipi	*Hernandia moerenhoutiana*	54	3
7364	pua, Chinese lantern tree	*Hernandia nymphaeifolia*	54	3
7365	Hernandia ovigera	*Hernandia ovigera*	54	3
7366	mago	*Hernandia sonora*	54	3
7367	Hernandia	*Hernandia spp.*	54	3
7370	Lanai island-aster	*Hesperomannia arborescens*	54	3
7371	Maui island-aster	*Hesperomannia arbuscula*	54	3
7372	Kauai island-aster	*Hesperomannia lydgatei*	54	3
7373	island-aster	*Hesperomannia spp.*	54	3
7374	toyon	*Heteromeles arbutifolia*	54	3
7376	toyon	*Heteromeles spp.*	54	3
7377	palma brava	*Heterospathe elata*	53	3
7381	para rubber tree	*Hevea brasiliensis*	54	3
7384	hau kuahiwi	*Hibiscadelphus bombycinus*	54	3
7385	lava hau kuahiwi	*Hibiscadelphus crucibracteatus*	54	3
7386	Kauai hau kuahiwi	*Hibiscadelphus distans*	54	3
7387	Kilauea hau kuahiwi	*Hibiscadelphus giffardianus*	54	3
7388	Hualalai hau kuahiwi	*Hibiscadelphus hualalaiensis*	54	3
7389	hau kuahiwi	*Hibiscadelphus puakuahiwi*	54	3
7390	hibiscadelphus	*Hibiscadelphus spp.*	54	3
7391	Maui hau kuahiwi	*Hibiscadelphus wilderianus*	54	3
7392	Woods hau kuahiwi	*Hibiscadelphus woodii*	54	3
7393	white rosemallow	*Hibiscus arnottianus*	54	3
7397	Brackenridges rosemallow	*Hibiscus brackenridgei*	54	3
7401	lemonyellow rosemallow	*Hibiscus calyphyllus*	54	3
7402	red Kauai rosemallow	*Hibiscus clayi*	54	3
7403	mahoe	*Hibiscus elatus*	54	3
7404	red rosemallow	*Hibiscus kokio*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7407	largeleaf rosemallow	*Hibiscus macrophyllus*	54	3
7408	Dixie rosemallow	*Hibiscus mutabilis*	54	3
7411	rosemallow	*Hibiscus spp.*	54	3
7412	sea hibiscus	*Hibiscus tiliaceus*	54	3
7413	white Kauai rosemallow	*Hibiscus waimeae*	54	3
7424	Homalium whitmeeanum	*Homalium whitmeeanum*	54	3
7427	chemeklachel, eumail	*Horsfieldia amklaal*	54	3
7428	ersachel	*Horsfieldia novoguineensis*	54	3
7429	Horsfieldia nunu	*Horsfieldia nunu*	54	3
7430	chersachel	*Horsfieldia palauensis*	54	3
7431	Horsfieldia	*Horsfieldia spp.*	54	3
7440	nightblooming cactus	*Hylocereus spp.*	54	3
7441	nightblooming cactus	*Hylocereus undatus*	54	3
7448	Canary Island St. Johnswort	*Hypericum canariense*	54	3
7453	Hawaii holly	*Ilex anomala*	54	3
7454	English holly	*Ilex aquifolium*	54	3
7460	mate	*Ilex paraguariensis*	54	3
7464	holly	*Ilex spp.*	54	3
7475	ifi	*Inocarpus fagifer*	54	3
7477	ifilele	*Intsia bijuga*	54	3
7482	black poui	*Jacaranda mimosifolia*	54	3
7483	jacaranda	*Jacaranda spp.*	54	3
7491	Barbados nut	*Jatropha curcas*	54	3
7494	nettlespurge	*Jatropha spp.*	54	3
7497	ketoguit	*Kayea pacifica*	54	3
7506	guest tree	*Kleinhovia hospita*	54	3
7509	Molokai treecotton	*Kokia cookei*	54	3
7510	Hawaii treecotton	*Kokia drynarioides*	54	3
7511	Kauai treecotton	*Kokia kauaiensis*	54	3
7512	Wailupe Valley treecotton	*Kokia lanceolata*	54	3
7513	treecotton	*Kokia spp.*	54	3
7516	burgan	*Kunzea ericoides*	54	3
7517	Kunzea	*Kunzea spp.*	54	3
7518	summit labordia	*Labordia fagraeoidea*	54	3
7519	bog labordia	*Labordia hedyosmifolia*	54	3
7520	mountain labordia	*Labordia hirtella*	54	3
7521	Waianae Range labordia	*Labordia kaalae*	54	3
7522	Wahiawa Mountain labordia	*Labordia lydgatei*	54	3
7523	labordia	*Labordia spp.*	54	3
7524	paleflower labordia	*Labordia tinifolia*	54	3
7528	Lanai labordia	*Labordia triflora*	54	3
7529	Nevada peavine	*Labordia waiolani*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7533	pride of India	*Lagerstroemia speciosa*	54	3
7539	Langsat	*Lansium domesticum*	54	3
7543	bluelatan	*Latania loddigesii*	54	3
7558	large-leaf yellow teatree	*Leptospermum morrisonii*	54	3
7559	common teatree	*Leptospermum petersonii*	54	3
7560	common teatree	*Leptospermum polygalifolim*	54	3
7561	broom teatree	*Leptospermum scoparium*	54	3
7562	teatree	*Leptospermum spp.*	54	3
7564	Leucaena insularum	*Leucaena insularum*	54	3
7565	white leadtree	*Leucaena leucocephala*	54	3
7566	leadtree	*Leucaena spp.*	54	3
7575	Chinese privet	*Ligustrum sinense*	54	3
7576	privet	*Ligustrum spp.*	54	3
7583	Lychee	*Litchi chinensis*	54	3
7586	papaono	*Litsea samoensis*	54	3
7587	Litsea	*Litsea spp.*	54	3
7588	fountain palm	*Livistona chinensis*	54	3
7595	vinegartree	*Lophostemon confertus*	54	3
7598	Egg Fruit / Canistel	*Lucuma nervosa*	54	3
7602	bakauaine, nana	*Lumnitzera littorea*	54	3
7614	macadamia nut tree, pengua	*Macadamia integrifolia*	54	3
7616	Macadamia	*Macadamia spp.*	54	3
7617	Macadamia Nut	*Macadamia tetraphylla*	54	3
7618	bedel	*Macaranga carolinensis*	54	3
7619	Macaranga grayana	*Macaranga grayana*	54	3
7620	lau pata	*Macaranga harveyana*	54	3
7621	pengua	*Macaranga mappa*	54	3
7623	macaranga	*Macaranga spp.*	54	3
7625	lau fatu	*Macaranga stipulosa*	54	3
7626	parasol leaf tree	*Macaranga tanarius*	54	3
7627	Macaranga thompsonii	*Macaranga thompsonii*	54	3
7638	Mallotus palauensis	*Mallotus palauensis*	54	3
7639	kamala tree	*Mallotus philippensis*	54	3
7641	mallotus	*Mallotus spp.*	54	3
7642	Mallotus tiliifolius	*Mallotus tiliifolius*	54	3
7653	manapau	*Mammea glauca*	54	3
7654	chopak	*Mammea odorata*	54	3
7655	Mammea	*Mammea spp.*	54	3
7657	kanit	*Mangifera minor*	54	3
7658	saipan mango	*Mangifera odorata*	54	3
7659	mango	*Mangifera spp.*	54	3
7660	ceara rubbertree	*Manihot glaziovii*	54	3
7661	manihot	*Manihot spp.*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7664	pani	*Manilkara dissecta*	54	3
7666	kohle	*Manilkara hoshinoi*	54	3
7671	Manilkara	*Manilkara spp.*	54	3
7672	udeuid	*Manilkara udoido*	54	3
7674	sapodilla	*Manilkara zapota*	54	3
7679	bkau, apgau	*Maranthes corymbosa*	54	3
7680	dermarm	*Marattia fraxinea*	54	3
7704	Medusanthera carolinensis	*Medusanthera carolinensis*	54	3
7705	matamo	*Medusanthera samoensis*	54	3
7706	Medusanthera	*Medusanthera spp.*	54	3
7709	melaleuca	*Melaleuca spp.*	54	3
7710	alom	*Melanolepis multiglandulosa*	54	3
7712	Melastoma candidum	*Melastoma candidum*	54	3
7713	Melastoma sanguineum	*Melastoma sanguineum*	54	3
7716	melia	*Melia spp.*	54	3
7719	mokihana	*Melicope anisata*	54	3
7720	Ballous melicope	*Melicope balloui*	54	3
7721	uahiapele	*Melicope barbigera*	54	3
7722	Waianae Range melicope	*Melicope christophersenii*	54	3
7723	manena	*Melicope cinerea*	54	3
7724	kukaemoa	*Melicope clusiifolia*	54	3
7725	piloula	*Melicope cruciata*	54	3
7726	leiohiiaka	*Melicope elliptica*	54	3
7727	Haleakala melicope	*Melicope haleakalae*	54	3
7728	Haupa Mountain melicope	*Melicope haupuensis*	54	3
7729	mokihana kukae moa	*Melicope hawaiensis*	54	3
7730	Monoa melicope	*Melicope hiiakae*	54	3
7731	Honolulu melicope	*Melicope hosakae*	54	3
7732	Kaala melicope	*Melicope kaalaensis*	54	3
7733	Olokele Valley melicope	*Melicope knudsenii*	54	3
7734	Kaholuamanu melicope	*Melicope macropus*	54	3
7735	Makaha Valley melicope	*Melicope makahae*	54	3
7736	Molokai melicope	*Melicope molokaiensis*	54	3
7737	alani	*Melicope mucronulata*	54	3
7738	Oahu melicope	*Melicope oahuensis*	54	3
7739	Makawao melicope	*Melicope obovata*	54	3
7740	Honokahua melicope	*Melicope orbicularis*	54	3
7741	Hana melicope	*Melicope ovalis*	54	3
7742	eggshape melicope	*Melicope ovata*	54	3
7743	pale melicope	*Melicope pallida*	54	3
7744	Lihue melicope	*Melicope paniculata*	54	3
7745	boxfruit alani	*Melicope peduncularis*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7746	Kohala Summit melicope	*Melicope pseudoanisata*	54	3
7747	hairy melicope	*Melicope puberula*	54	3
7748	fourangle melicope	*Melicope quadrangularis*	54	3
7749	kapu melicope	*Melicope radiata*	54	3
7750	soopini	*Melicope latifolia*	54	3
7751	roundleaf melicope	*Melicope rotundifolia*	54	3
7752	St. Johns melicope	*Melicope saint-johnii*	54	3
7753	Mt. Kaala melicope	*Melicope sandwicensis*	54	3
7754	melicope	*Melicope spp.*	54	3
7755	volcanic melicope	*Melicope volcanica*	54	3
7756	alani wai	*Melicope waialealae*	54	3
7757	Monoa melicope	*Melicope wawraeana*	54	3
7758	kipuka piaula	*Melicope zahlbruckneri*	54	3
7759	samoensis	*Melicytus samoensis*	54	3
7766	mao	*Melochia aristata*	54	3
7767	melochia	*Melochia spp.*	54	3
7769	hierba del soldado	*Melochia umbellata*	54	3
7774	faniok	*Merrilliodendron megacarpum*	54	3
7776	fagufagu	*Meryta macrophylla*	54	3
7777	omechidel	*Meryta senfftiana*	54	3
7778	Meryta	*Meryta spp.*	54	3
7781	collina	*Metrosideros collina*	54	3
7782	ohia	*Metrosideros macropus*	54	3
7783	ohia lehua	*Metrosideros polymorpha*	54	3
7792	lehua papa	*Metrosideros rugosa*	54	3
7793	lehua	*Metrosideros spp.*	54	3
7794	lehua ahihi	*Metrosideros tremuloides*	54	3
7795	Kauai bottlebrush	*Metrosideros waialealae*	54	3
7798	ivory-nut palm	*Metroxylon amicarum*	53	3
7799	sago palm	*Metroxylon sagu*	53	3
7800	Metroxylon	*Metroxylon spp.*	53	3
7801	Orange Champak	*Michelia champaca*	54	3
7805	velvet tree	*Miconia calvescens*	54	3
7824	talafulu	*Micromelum minutum*	54	3
7831	pinnata	*Millettia pinnata*	54	3
7835	bulletwood, elengi	*Mimusops elengi*	54	3
7841	treedaisy	*Montanoa hibiscifolia*	54	3
7842	montanoa	*Montanoa spp.*	54	3
7845	Morella cerifera	*Morella cerifera*	54	3
7846	firetree	*Morella faya*	54	3
7848	bayberry	*Morella spp.*	54	3
7849	Indian mulberry	*Morinda citrifolia*	54	3
7850	ngel	*Morinda latibractea*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7851	Morinda pedunculata	*Morinda pedunculata*	54	3
7852	morinda	*Morinda spp.*	54	3
7853	noni kuahiwi	*Morinda trimera*	54	3
7855	horseradishtree	*Moringa oleifera*	54	3
7865	falseohe	*Munroidendron racemosum*	54	3
7867	strawberrytree	*Muntingia calabura*	54	3
7868	muntingia	*Muntingia spp.*	54	3
7872	French plantain	*Musa paradisiaca*	52	3
7873	bungeltuu	*Musa coccinea*	52	3
7874	tama	*Musa nana*	52	3
7875	tuu banana	*Musa sapientum*	52	3
7876	meia	*Musa spp.*	52	3
7877	blantalos	*Musa textilis*	52	3
7878	tikap	*Musa tikap*	52	3
7879	fei banana	*Musa troglodytarum*	52	3
7880	Mussaenda frondosa	*Mussaenda frondosa*	54	3
7881	aloalo vao	*Mussaenda raiateensis*	54	3
7882	Mussaenda	*Mussaenda spp.*	54	3
7883	naio	*Myoporum sandwicense*	54	3
7884	myoporum	*Myoporum spp.*	54	3
7892	rodwood	*Myrcia spp.*	54	3
7899	yamamomo, strawberry tree	*Myrica rubra*	54	3
7900	sweetgale	*Myrica spp.*	54	3
7902	atoneulu	*Myristica hypargyraea*	54	3
7903	adepurot	*Myristica insularis*	54	3
7904	Myristica	*Myristica spp.*	54	3
7906	Myristica inutilis	*Myristica inutilis*	54	3
7910	forest colicwood	*Myrsine alyxifolia*	54	3
7913	summit colicwood	*Myrsine degeneri*	54	3
7914	mountain colicwood	*Myrsine emarginata*	54	3
7915	streambank colicwood	*Myrsine fernseei*	54	3
7916	Koolau Range colicwood	*Myrsine fosbergii*	54	3
7918	Wahiawa Bog colicwood	*Myrsine helleri*	54	3
7919	Kauai colicwood	*Myrsine kauaiensis*	54	3
7920	Kokee colicwood	*Myrsine knudsenii*	54	3
7921	Lanai colicwood	*Myrsine lanaiensis*	54	3
7922	kolea lau nui	*Myrsine lessertiana*	54	3
7923	Hanapepe River colicwood	*Myrsine mezii*	54	3
7924	swamp colicwood	*Myrsine petiolata*	54	3
7925	Molokai colicwood	*Myrsine pukooensis*	54	3
7926	kokea lau lii	*Myrsine sandwicensis*	54	3
7927	colicwood	*Myrsine spp.*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
7928	Mt. Kahili colicwood	*Myrsine wawraea*	54	3
7942	fao	*Neisosperma oppositifolia*	54	3
7948	afa	*Neonauclea forsteri*	54	3
7952	Rambutan	*Nephelium lappaceum*	54	3
7954	maaloa	*Neraudia melastomifolia*	54	3
7958	keahi	*Nesoluma polynesicum*	54	3
7960	Hawaii olive	*Nestegis sandwicensis*	54	3
7961	nestegis	*Nestegis spp.*	54	3
7962	kalm, aralm	*Neuburgia celebica*	54	3
7964	tree tobacco	*Nicotiana glauca*	54	3
7965	tobacco	*Nicotiana spp.*	54	3
7966	smallflower aiea	*Nothocestrum breviflorum*	54	3
7967	broadleaf aiea	*Nothocestrum latifolium*	54	3
7968	longleaf aiea	*Nothocestrum longifolium*	54	3
7969	Oahu aiea	*Nothocestrum peltatum*	54	3
7970	aiea	*Nothocestrum spp.*	54	3
7971	kaala rockwort	*Nototrichium humile*	54	3
7972	Hawaii rockwort	*Nototrichium sandwicense*	54	3
7974	toechel, teuechel	*Nypa fruiticans*	54	3
7977	ochna	*Ochna spp.*	54	3
7978	Thomas birds-eye bush	*Ochna thomasiana*	54	3
7980	Ochroma pyramidale	*Ochroma pyramidale*	54	3
7982	holei	*Ochrosia compta*	54	3
7983	island yellowwood	*Ochrosia haleakalae*	54	3
7984	Kauai yellowwood	*Ochrosia kauaiensis*	54	3
7985	Hawaii yellowwood	*Ochrosia kilaueaensis*	54	3
7986	yellowwood	*Ochrosia spp.*	54	3
8000	oleander fern	*Oleandra neriiformis*	54	4
8004	olive	*Olea europaea*	54	3
8007	olive	*Olea spp.*	54	3
8008	fanuamamala	*Homalanthus acuminatus*	54	3
8009	fanuamamala	*Homalanthus nutans*	54	3
8010	Homalanthus	*Homalanthus spp.*	54	3
8013	cochineal nopal cactus	*Opuntia cochenillifera*	54	3
8014	tuna cactus	*Opuntia ficus-indica*	54	3
8015	common pricklypear	*Opuntia monacantha*	54	3
8018	pricklypear	*Opuntia spp.*	54	3
8019	amansis, edebsungelked, necklace bead tree	*Ormosia calavensis*	54	3
8022	kesiamel	*Osmoxylon oliveri*	54	3
8023	kesiamel	*Osmoxylon pachyphyllum*	54	3
8024	Osmoxylon	*Osmoxylon spp.*	54	3
8036	miich era ngebard, guiana chestnut	*Pachira aquatica*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8044	gasu	*Palaquium stehlinii*	54	3
8054	chertochet	*Pandanus aimiriikensis*	53	3
8055	matal	*Pandanus cominsii*	53	3
8056	ongor	*Pandanus compressus*	53	3
8057	silaue	*Pandanus cylindricus*	53	3
8058	kienpel	*Pandanus dilatatus*	53	3
8059	ongor	*Pandanus divergens*	53	3
8060	pahong	*Pandanus dubius*	53	3
8061	ongor	*Pandanus duriocarpus*	53	3
8062	moak	*Pandanus enchabiensis*	53	3
8063	hara	*Pandanus fischerianus*	53	3
8064	aggag	*Pandanus fragrans*	53	3
8065	nenketak	*Pandanus hosinoi*	53	3
8066	pacheren	*Pandanus jaluitensis*	53	3
8067	buuk	*Pandanus kanehirae*	53	3
8068	siu	*Pandanus korrensis*	53	3
8069	lakatwa	*Pandanus lakatwa*	53	3
8070	erwan, jonmouia	*Pandanus laticanaliculatus*	53	3
8071	intekul, pasyure	*Pandanus macrocephalus*	53	3
8072	ongor, ertochet	*Pandanus macrojeanneretia*	53	3
8073	menne	*Pandanus menne*	53	3
8074	Palaquium karrak	*Palaquium karrak*	54	3
8075	Pandanus odontoides	*Pandanus odontiodes*	53	3
8076	ongor, ertochet	*Pandanus palawensis*	53	3
8077	peet	*Pandanus patina*	53	3
8078	ongor	*Pandanus peliliuensis*	53	3
8079	alwan, kipal, taip	*Pandanus ponapensis*	53	3
8080	deipw, jomineia	*Pandanus pulposus*	53	3
8081	pathaplip	*Pandanus rectangulatus*	53	3
8082	fasa	*Pandanus reineckei*	53	3
8083	magojokojok	*Pandanus rotundatus*	53	3
8084	screwpine	*Pandanus spp.*	53	3
8085	Tahitian screwpine	*Pandanus tectorius*	53	3
8086	kiparenwel	*Pandanus tolotomensis*	53	3
8087	mojel	*Pandanus trukensis*	53	3
8088	common screwpine	*Pandanus utilis*	53	3
8090	berrakelongor	*Pandanus variegatus*	53	3
8091	rauel	*Pangium edule*	54	3
8092	lonlin, lajokorer	*Pandanus obliquus*	53	3
8103	sea	*Parinari insularum*	54	3
8104	ais	*Parinari laurina*	54	3
8105	Parinari	*Parinari spp.*	54	3
8107	Parkia korom	*Parkia korom*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8108	kmekumer	*Parkia parvifoliola*	54	3
8111	Jerusalem thorn	*Parkinsonia aculeata*	54	3
8112	paloverde	*Parkinsonia spp.*	54	3
8121	Peltophorum pterocarpum	*Peltophorum pterocarpum*	54	3
8123	ngis	*Pemphis acidula*	54	3
8129	Pericopsis mooniana	*Pericopsis mooniana*	54	3
8131	olomea	*Perrottetia sandwicensis*	54	3
8151	Canary Island date palm	*Phoenix canariensis*	53	3
8152	date palm	*Phoenix dactylifera*	53	3
8153	date palm	*Phoenix spp.*	53	3
8154	date palm	*Phoenix sylvestris*	53	3
8155	Chinese photinia	*Photinia davidiana*	53	3
8157	Tahitian gooseberry tree	*Phyllanthus acidus*	54	3
8159	pamakani mahu	*Phyllanthus distichus*	54	3
8175	allspice	*Pimenta dioica*	54	3
8178	bayrumtree	*Pimenta racemosa var. grisea*	54	3
8180	Pimenta	*Pimenta spp.*	54	3
8181	chebouch, demailei	*Pinanga insignis*	54	3
8183	Caribbean pine	*Pinus caribaea*	51	1
8187	Mexican weeping pine	*Pinus patula*	51	1
8188	maritime pine	*Pinus pinaster*	51	1
8205	Waimea pipturus	*Pipturus albidus*	54	3
8206	soga	*Pipturus argenteus*	54	3
8207	pipturus	*Pipturus spp.*	54	3
8210	piscidia	*Piscidia spp.*	54	3
8212	Australasian catchbirdtree	*Pisonia brunoniana*	54	3
8213	grand devils-claws	*Pisonia grandis*	54	3
8214	aulu	*Pisonia sandwicensis*	54	3
8215	catchbirdtree	*Pisonia spp.*	54	3
8217	umbrella catchbirdtree	*Pisonia umbellifera*	54	3
8218	Kauai catchbirdtree	*Pisonia wagneriana*	54	3
8220	monkeypod	*Pithecellobium dulce*	54	3
8224	Mona cheesewood, Pittosporum	*Pittosporum monae*	54	3
8226	Hawaii poisonberry tree	*Pittosporum argentifolium*	54	3
8227	hoawa	*Pittosporum confertiflorum*	54	3
8228	Waianae Range cheesewood	*Pittosporum flocculosum*	54	3
8229	Waialeale cheesewood	*Pittosporum gayanum*	54	3
8230	Koolau Range cheesewood	*Pittosporum glabrum*	54	3
8231	hoawa	*Pittosporum halophilum*	54	3
8232	Hawaii cheesewood	*Pittosporum hawaiiense*	54	3
8233	Kona cheesewood	*Pittosporum hosmeri*	54	3
8234	Kauai cheesewood	*Pittosporum kauaiense*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8235	royal cheesewood	*Pittosporum napaliense*	54	3
8236	Taiwanese cheesewood	*Pittosporum pentandrum*	54	3
8238	cheesewood	*Pittosporum spp.*	54	3
8239	cream cheesewood	*Pittosporum terminalioides*	54	3
8240	Australian cheesewood	*Pittosporum undulatum*	54	3
8241	cape cheesewood	*Pittosporum viridiflorum*	54	3
8242	alaa	*Planchonella garberi*	54	3
8243	alaa	*Planchonella grayana*	54	3
8244	alaa	*Planchonella linggensis*	54	3
8246	mamalava	*Planchonella samoensis*	54	3
8247	Planchonella	*Planchonella spp.*	54	3
8248	mamalava	*Planchonella torricellensis*	54	3
8250	Hawaii pilo kea	*Platydesma remyi*	54	3
8251	Maui pilo kea	*Platydesma spathulata*	54	3
8252	platydesma	*Platydesma spp.*	54	3
8257	golden hala pepe	*Pleomele aurea*	54	3
8258	Maui hala pepe	*Pleomele auwahiensis*	54	3
8259	Lanai hala pepe	*Pleomele fernaldii*	54	3
8260	Waianae Range hala pepe	*Pleomele forbesii*	54	3
8261	royal hala pepe	*Pleomele halapepe*	54	3
8262	Hawaii hala pepe	*Pleomele hawaiiensis*	54	3
8263	hala pepe	*Pleomele spp.*	54	3
8269	Plumeria obtusa	*Plumeria obtusa var. obtusa*	54	3
8271	templetree	*Plumeria rubra*	54	3
8272	Plumeria	*Plumeria spp.*	54	3
8283	bungaruau	*Polyscias granifolia*	54	3
8286	bngei	*Polyscias nodosa*	54	3
8287	tagitagi	*Polyscias samoensis*	54	3
8288	shield aralia	*Polyscias scutellaria*	54	3
8289	Polyscias	*Polyscias spp.*	54	3
8290	tava	*Pometia pinnata*	54	3
8292	kattai	*Ponapea hosinoi*	54	3
8293	Ponapea ledermanniana	*Ponapea ledermanniana*	54	3
8294	Ponapea	*Ponapea spp.*	54	3
8295	kisaks	*Pongamia pinnata*	54	3
8297	Abiu	*Pouteria caimito*	54	3
8298	elangel, chelangel	*Pouteria calcarea*	54	3
8299	eggfruit	*Pouteria campechiana*	54	3
8303	lalahag	*Pouteria obovata*	54	3
8304	alaa	*Pouteria sandwicensis*	54	3
8305	mammee sapote	*Pouteria sapota*	54	3
8306	pouteria	*Pouteria spp.*	54	3
8307	ahgao	*Premna obtusifolia*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8308	Premna pubescens	*Premna pubescens*	54	3
8309	aloalo	*Premna serratifolia*	54	3
8310	Premna	*Premna spp.*	54	3
8315	Hawaii pritchardia	*Pritchardia affinis*	53	3
8316	Maui pritchardia	*Pritchardia arecina*	53	3
8317	Kilauea pritchardia	*Pritchardia beccariana*	53	3
8318	Mt. Eke pritchardia	*Pritchardia forbesiana*	53	3
8319	Makaleha pritchardia	*Pritchardia hardyi*	53	3
8320	loulu lelo	*Pritchardia hillebrandii*	53	3
8321	Waianae Range pritchardia	*Pritchardia kaalae*	53	3
8322	Lanai pritchardia	*Pritchardia lanaiensis*	53	3
8323	loulu	*Pritchardia lanigera*	53	3
8324	Limahuli Valley pritchardia	*Pritchardia limahuliensis*	53	3
8325	Molokai pritchardia	*Pritchardia lowreyana*	53	3
8326	Koolau Range pritchardia	*Pritchardia martii*	53	3
8327	Alakai Swamp pritchardia	*Pritchardia minor*	53	3
8328	Kamalo pritchardia	*Pritchardia munroi*	53	3
8329	fan palm	*Pritchardia pacifica*	53	3
8330	Waioli Valley pritchardia	*Pritchardia perlmanii*	53	3
8331	Nihoa pritchardia	*Pritchardia remota*	53	3
8336	lands of papa pritchardia	*Pritchardia schattaueri*	53	3
8337	pritchardia	*Pritchardia spp.*	53	3
8338	stickybud pritchardia	*Pritchardia viscosa*	53	3
8339	poleline pritchardia	*Pritchardia waialealeana*	53	3
8341	fua lole	*Procris pedunculata*	54	4
8343	mesquite	*Prosopis juliflora*	54	3
8344	kiawe	*Prosopis pallida*	54	3
8355	strawberry guava	*Psidium cattleianum*	54	3
8356	guava	*Psidium guajava*	54	3
8365	Koolau Range wild coffee	*Psychotria fauriei*	54	3
8366	largeflower wild coffee	*Psychotria grandiflora*	54	3
8369	Kauai wild coffee	*Psychotria greenwelliae*	54	3
8370	Waianae Range wild coffee	*Psychotria hathewayi*	54	3
8373	kopikoula	*Psychotria hawaiiensis*	54	3
8377	woodland wild coffee	*Psychotria hexandra*	54	3
8382	Oahu wild coffee	*Psychotria hexandra spp. oahuensis*	54	3
8386	mililii kopiwai	*Psychotria hobdyi*	54	3
8387	matalafi	*Psychotria insularum*	54	3
8388	kopiko kea	*Psychotria kaduana*	54	3
8390	aplohkateng	*Psychotria mariana*	54	3
8392	forest wild coffee	*Psychotria mariniana*	54	3
8393	opiko	*Psychotria mauiensis*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8398	Psychotria rhombocarpa	*Psychotria rhombocarpa*	54	3
8399	Psychotria rotensis	*Psychotria rotensis*	54	3
8400	wild coffee	*Psychotria spp.*	54	3
8401	leatherleaf wild coffee	*Psychotria wawrae*	54	3
8402	alahee	*Psydrax odorata*	54	3
8404	Kauai pteralyxia	*Pteralyxia kauaiensis*	54	3
8405	ridged pteralyxia	*Pteralyxia macrocarpa*	54	3
8406	pteralyxia	*Pteralyxia spp.*	54	3
8407	pterocarpus	*Pterocarpus indicus*	54	3
8412	Ptychococcus ledermannianus	*Ptychococcus ledermannianus*	54	3
8415	Macarthur feather palm	*Ptychosperma macarthuri*	53	3
8416	chesdbuuch	*Ptychosperma palauense*	53	3
8418	Ptychosperma	*Ptychosperma spp.*	53	3
8424	cork oak	*Quercus suber*	54	3
8430	togo vao	*Rapanea myricifolia*	54	3
8431	poison devils-pepper	*Rauvolfia vomitoria*	54	4
8432	omechidel	*Rauvolfia insularis*	54	3
8434	devils-pepper	*Rauvolfia sandwicensis*	54	3
8435	devils-pepper	*Rauvolfia spp.*	54	3
8436	traveler's tree	*Ravenala madagascariensis*	53	3
8440	vi vao	*Reynoldsia lanutoensis*	54	3
8442	ohe makai	*Reynoldsia sandwicensis*	54	3
8443	reynoldsia	*Reynoldsia spp.*	54	3
8456	Rheeda	*Rheedia edulis*	54	3
8458	mangle	*Rhizophora apiculata*	54	3
8460	Rhizophora lamarckii	*Rhizophora lamarckii*	54	3
8462	mangle hembra	*Rhizophora mucronata*	54	3
8463	mangrove	*Rhizophora spp.*	54	3
8464	Rhizophora stylosa	*Rhizophora stylosa*	54	3
8465	rose myrtle	*Rhodomyrtus spp.*	54	3
8466	Rhodomyrtus tomentosus	*Rhodomyrtus tomentosa*	54	3
8467	neneleau	*Rhus sandwicensis*	54	3
8468	sumac	*Rhus spp.*	54	3
8469	tavai	*Rhus taitensis*	54	3
8472	castorbean	*Ricinus communis*	54	3
8473	ricinus	*Ricinus spp.*	54	3
8474	Rinorea carolinensis	*Rinorea carolinensis*	54	3
8480	Rollinia	*Rollinia deliciosa*	54	3
8490	Roystonea elata	*Roystonea elata*	53	3
8491	royal palm	*Roystonea oleracea*	53	3
8503	etkeam, cheskeam	*Samadera indica*	54	3
8505	raintree	*Samanea saman*	54	3
8506	raintree	*Samanea spp.*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8509	common elderberry	*Sambucus nigra*	54	3
8510	raintree	*Sambucus spp.*	54	3
8515	santol, kechapi	*Sandoricum koetjape*	54	4
8516	coastal sandalwood	*Santalum ellipticum*	54	3
8517	forest sandalwood	*Santalum freycinetianum*	54	3
8521	Haleakala sandalwood	*Santalum haleakalae*	54	3
8522	mountain sandalwood	*Santalum paniculatum*	54	3
8525	willowleaf sandalwood	*Santalum salicifolium*	54	3
8526	sandalwood	*Santalum spp.*	54	3
8528	lonomea	*Sapindus oahuense*	54	3
8529	wingleaf soapberry	*Sapindus saponaria*	54	3
8531	soapberry	*Sapindus spp.*	54	3
8532	vitiensis	*Sapindus vitiensis*	54	3
8534	maskerekur	*Sapium indicum*	54	3
8544	uunu	*Sarcopygme pacifica*	54	3
8548	Scaevola, naupaka	*Scaevola cerasifolia*	54	3
8549	naupaka kuahiwi	*Scaevola chamissoniana*	54	3
8550	mountain naupaka	*Scaevola gaudichaudiana*	54	3
8551	forest naupaka	*Scaevola procera*	54	3
8552	naupaka	*Scaevola spp.*	54	3
8555	schaefferia	*Schaefferia spp.*	54	3
8559	samoensis	*Schefflera samoensis*	54	3
8560	Toitoi	*Scaevola taccada*	54	3
8561	Peruvian peppertree	*Schinus molle*	54	3
8563	Brazilian peppertree	*Schinus terebinthifolius*	54	3
8577	kuat	*Scyphiphora hydrophyllacea*	54	3
8583	poumuli	*Securinega flexuosa*	54	3
8586	tonget	*Semecarpus venenosa*	54	3
8588	emperor's candlesticks	*Senna alata*	54	3
8590	Gaudichauds senna	*Senna gaudichaudii*	54	3
8591	false sicklepod	*Senna multijuga*	54	3
8592	valamuerto	*Senna pendula*	54	3
8595	senna	*Senna septemtrionalis*	54	3
8596	Siamese cassia	*Senna siamea*	54	3
8598	senna	*Senna spp.*	54	3
8599	Senna sulfurea	*Senna sulfurea*	54	3
8600	glossy shower	*Senna surattensis*	54	3
8601	ukall	*Serianthes kanehirae*	54	3
8603	hayun lago, trongkon guafi	*Serianthes nelsonii*	54	3
8605	vegetable hummingbird	*Sesbania grandiflora*	54	3
8606	Egyptian riverhemp	*Sesbania sesban*	54	3
8607	riverhemp	*Sesbania spp.*	54	3
8609	yellow llima	*Sida fallax*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8610	fanpetals	*Sida spp.*	54	3
8628	American black nightshade	*Solanum americanum*	54	3
8631	earleaf nightshade	*Solanum mauritianum*	54	3
8635	nightshade	*Solanum spp.*	54	3
8636	turkey berry	*Solanum torvum*	54	3
8639	mangrove	*Sonneratia alba*	54	3
8641	mamani	*Sophora chrysophylla*	54	3
8642	necklacepod	*Sophora spp.*	54	3
8643	silver bush	*Sophora tomentosa*	54	3
8644	African tuliptree	*Spathodea campanulata*	54	3
8645	spathodea	*Spathodea spp.*	54	3
8646	Spiraeanthemum samoense	*Spiraeanthemum samoense*	54	3
8649	Spondias dulcis	*Spondias dulcis*	54	3
8650	yellow mombin	*Spondias mombin*	54	3
8653	Spondias	*Spondias spp.*	54	3
8655	ngmui	*Stemonurus ammui*	54	3
8656	titmel	*Spondias pinnata*	54	3
8665	fanaio	*Sterculia fanaiho*	54	3
8667	Sterculia palauensis	*Sterculia palauensis*	54	3
8669	anthropophagorum	*Streblus anthropophagorum*	54	3
8670	Hawaii roughbush	*Streblus pendulinus*	54	3
8671	streblus	*Streblus spp.*	54	3
8676	bay cedar	*Suriana maritima*	54	3
8678	mahogany	*Swietenia spp.*	54	3
8679	Honduras mahogany	*Swietenia macrophylla*	54	3
8687	chebtui, ebtui	*Symplocos racemosa*	54	3
8689	turpentine tree	*Syncarpia glomulifera*	54	3
8690	turpentine tree	*Syncarpia spp.*	54	3
8691	Miracle Berry	*Synsepalum dulcificum*	54	3
8695	asi	*Syzygium brevifolium*	54	3
8696	popona	*Syzygium carolinense*	54	3
8697	asi vai	*Syzygium clusiifolium*	54	3
8699	asi vai	*Syzygium dealatum*	54	3
8700	asi	*Syzygium inophylloides*	54	3
8701	Syzygium jambos	*Syzygium jambos*	54	3
8702	Malaysian apple	*Syzygium malaccense*	54	3
8703	popona	*Syzygium richii*	54	3
8704	nonu vao	*Syzygium samarangense*	54	3
8705	fena vao	*Syzygium samoense*	54	3
8706	ohia ha	*Syzygium sandwicense*	54	3
8708	syzygium	*Syzygium spp.*	54	3
8714	pink tabebuia	*Tabebuia pallida*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8718	trumpet-tree	*Tabebuia spp.*	54	3
8719	Tabernaemontana aurantiaca	*Tabernaemontana aurantiaca*	54	3
8722	Pulu	*Tabernaemontana pandacaqui*	54	3
8723	Tabernaemontana rotensis	*Tabernaemontana rotensis*	54	3
8737	manunu	*Tarenna sambucina*	54	3
8741	chestnutleaf trumpetbush	*Tecoma castanifolia*	54	3
8743	yellow trumpetbush	*Tecoma stans*	54	3
8744	teak	*Tectona grandis*	54	3
8745	tectona	*Tectona spp.*	54	3
8748	tropical almond	*Terminalia spp.*	54	3
8749	kehma	*Terminalia carolinensis*	54	3
8750	tropical almond	*Terminalia catappa*	54	3
8751	esemiich, chesemiich	*Terminalia crassipes*	54	3
8752	esemiich, chesemiich	*Terminalia edulis*	54	3
8755	tropical almond	*Terminalia kaernbachii*	54	3
8756	East Indian almond	*Terminalia myriocarpa*	54	3
8758	malili	*Terminalia richii*	54	3
8759	talie	*Terminalia samoensis*	54	3
8770	Flynnsohe	*Tetraplasandra flynnii*	54	3
8771	Koolau Rangeohe	*Tetraplasandra gymnocarpa*	54	3
8772	Hawaii ohe	*Tetraplasandra hawaiensis*	54	3
8773	ohe ohe	*Tetraplasandra kavaiensis*	54	3
8774	ohe mauka	*Tetraplasandra oahuensis*	54	3
8775	tetraplasandra	*Tetraplasandra spp.*	54	3
8776	Mt. Waialeale ohe	*Tetraplasandra waialealae*	54	3
8777	ohe kiko ola	*Tetraplasandra waimeae*	54	3
8779	Florida clover ash	*Tetrazygia bicolor*	54	3
8784	cacao	*Theobroma cacao*	54	3
8787	Portia tree	*Thespesia populnea*	54	3
8788	thespesia	*Thespesia spp.*	54	3
8789	luckynut	*Thevetia peruviana*	54	3
8804	glorytree	*Tibouchina spp.*	54	3
8805	princess-flower	*Tibouchina urvilleana*	54	3
8806	Timonius corymbosus	*Timonius corymbosus*	54	3
8807	Timonius mollis	*Timonius mollis*	54	3
8808	Timonius	*Timonius spp.*	54	3
8809	Timonius subauritus	*Timonius subauritus*	54	3
8810	Timonius timon	*Timonius timon*	54	3
8811	redcedar	*Toona spp.*	54	3
8812	Australian redcedar	*Toona ciliata*	54	3
8822	olona	*Touchardia latifolia*	54	3
8823	touchardia	*Touchardia spp.*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8824	velvetleaf soldierbush	*Tournefortia argentea*	54	3
8826	soldierbush	*Tournefortia spp.*	54	3
8827	magele	*Trema cannabina*	54	3
8831	oriental trema	*Trema orientalis*	54	3
8832	trema	*Trema spp.*	54	3
8837	Trichospermum ikutai	*Trichospermum ikutai*	54	3
8838	elsau, oleiulakersus	*Trichospermum ledermannii*	54	3
8839	maouli	*Trichospermum richii*	54	3
8842	limeberry	*Triphasia trifolia*	54	3
8846	faia	*Tristiropsis obtusangula*	54	3
8856	hopue	*Urera glabra*	54	3
8857	opuhe	*Urera kaalae*	54	3
8858	urera	*Urera spp.*	54	3
8866	Manila palm	*Veitchia merrillii*	53	3
8869	mu oil tree	*Vernicia montana*	54	3
8870	vernicia	*Vernicia spp.*	54	3
8872	bars, beokel	*Vitex cofassus*	54	3
8874	smallflower chastetree	*Vitex parviflora*	54	3
8875	chastetree	*Vitex spp.*	54	3
8876	simpleleaf chastetree	*Vitex trifolia*	54	3
8884	ateate	*Wedelia biflora*	54	3
8886	Weinmannia affinis	*Weinmannia affinis*	54	3
8889	alpine false ohelo	*Wikstroemia bicornuta*	54	3
8890	forest false ohelo	*Wikstroemia furcata*	54	3
8891	montane false ohelo	*Wikstroemia monticola*	54	3
8892	Oahu false ohelo	*Wikstroemia oahuensis*	54	3
8895	Hawaii false ohelo	*Wikstroemia phillyreifolia*	54	3
8896	Kohala false ohelo	*Wikstroemia pulcherrima*	54	3
8897	variableleaf false ohelo	*Wikstroemia sandwicensis*	54	3
8898	Skottsbergs false ohelo	*Wikstroemia skottsbergiana*	54	3
8899	false ohelo	*Wikstroemia spp.*	54	3
8900	hairy false ohelo	*Wikstroemia villosa*	54	3
8901	tallow wood	*Ximenia americana*	54	3
8903	lalanyog	*Xylocarpus granatum*	54	3
8904	leilei	*Xylocarpus moluccensis*	54	3
8905	Xylocarpus	*Xylocarpus spp.*	54	3
8907	sawtooth logwood	*Xylosma crenata*	54	3
8908	Hawaii brushholly	*Xylosma hawaiiensis*	54	3
8909	Xylosma nelsonii	*Xylosma nelsonii*	54	3
8911	Xylosma samoensis	*Xylosma samoensis*	54	3
8915	xylosma	*Xylosma spp.*	54	3
8925	kawau	*Zanthoxylum dipetalum*	54	3
8929	Hawaii pricklyash	*Zanthoxylum hawaiiense*	54	3

SPCD	COMMON NAME	SCIENTIFIC NAME	SPGRPCD	MAJGRP
8930	Kauai pricklyash	*Zanthoxylum kauaense*	54	3
8933	Oahu pricklyash	*Zanthoxylum oahuense*	54	3
8936	pricklyash	*Zanthoxylum spp.*	54	3
8939	Indian jujube	*Ziziphus mauritiana*	54	3

Appendix I. Forest Inventory and Analysis (FIA) Plot Design Codes and Definitions by FIA Work Unit

FIA work unit	Plot design code (DESIGNCD)	Definition
[a]NRS-NE, [b]NRS-NC, [c]SRS, [d]RMRS, [e]PNWRS	1	National plot design consists of four 24-foot fixed-radius subplots for trees ≥5 inches DBH, and four 6.8-foot fixed-radius microplots for seedlings and trees ≥1 and <5 inches DBH. Subplot 1 is the center plot, and subplots 2, 3, and 4 are located 120.0 feet, horizontal, at azimuths of 360, 120, and 240, respectively. The microplot center is 12 feet east of the subplot center. Four 58.9–foot fixed-radius macroplots are optional. A plot may sample more than one condition. When multiple conditions are encountered, condition boundaries are delineated (mapped).
[a]NRS-NE	101	Various plot designs. Converted from Eastwide Database format, some fields may be null.
[a]NRS-NE	111	Four-subplot design similar to DESIGNCD 1, except the microplot for seedlings is 1/1000 acre (3.7-foot radius). If the plot is used for growth estimates, it is overlaid on a 5 subplot design, where remeasurement of trees (≥5 inches) is on subplot 1 only. Poletimber-sized trees remeasured on a 24-foot radius plot, sawtimber-sized trees remeasured on a 49-foot radius plot. If the plot is not used for growth estimates, it is an initial plot establishment.
[a]NRS-NE	112	DESIGNCD 111, except that if the plot is used for growth estimates, the remeasurement of trees (≥5 inches) is on the 24-foot-radius subplot 1 only, regardless of tree size or previous plot size or type (varied).
[a]NRS-NE	113	DESIGNCD 111, except that if the plot is used for growth estimates, the remeasurement of trees (≥5 inches) is on the 24-foot-radius subplot 1 only, regardless of tree size or previous plot size or type (single subplot 1/5 acre).
[a]NRS-NE	115	DESIGNCD 1. Overlaid on a FHM 4-subplot plot design. These plots are not used in change estimates.
[a]NRS-NE	116	DESIGNCD 1. Overlaid on 1/5 acre plot for all trees ≥5 inches DBH (1/5 acre plot was an initial measurement). Remeasurement of subplot 1 is only on the 24-foot-radius plot for all trees (≥5 inches), regardless of tree size or previous plot size.
[a]NRS-NE	117	DESIGNCD 1. Overlaid on 1/5 acre plot for all trees ≥5 inches DBH (1/5 acre plot was remeasurement). Remeasurement of subplot 1 is only on the 24-foot-radius plot for all trees (≥5 inches), regardless of tree size or previous plot size.
[a]NRS-NE	118	DESIGNCD 1. Overlaid on 10-subplot, variable-radius design. Remeasurement of trees (≥5 inches) on 5 of the 10 subplots; ingrowth based on trees (≥5 inches) that grew onto five 6.8-foot radius subplots.
[b]NRS-NC	301	Various plot designs. Converted from Eastwide Database format, some fields may be null.
[b]NRS-NC	311	Four-subplot design similar to DESIGNCD 1, except the 1/24 acre and 1/300 acre plots have common centers. Conditions are mapped and boundaries may be within the plots.
[b]NRS-NC	312	DESIGNCD 1. Initial plot establishment.
[b]NRS-NC	313	DESIGNCD 311. Overlaid on previous plots, no remeasurements.
[b]NRS-NC	314	DESIGNCD 1. Overlaid on previous plots, no remeasurements.
[b]NRS-NC	315	DESIGNCD 311. Overlaid on same design. Only trees ≥5 inches DBH are remeasured.
[b]NRS-NC	316	DESIGNCD 1. Overlaid on DESIGNCD 311 Only trees ≥5 inches DBH are remeasured.
[b]NRS-NC	317	DESIGNCD 1. Overlaid on DESIGNCD 326. Only the first 5 points (trees ≥5 inches DBH) and first 3, 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured, but conditions were not re-mapped.

FIA work unit	Plot design code (DESIGNCD)	Definition
[b]NRS-NC	318	DESIGNCD 311. Overlaid on DESIGNCD 325. Only the first 5 points (trees ≥5 inches DBH) and first 3, 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured.
[b]NRS-NC	319	DESIGNCD 1. Overlaid on DESIGNCD 325. Only the first 5 points (trees ≥5 inches DBH) and first 3, 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured.
[b]NRS-NC	320	DESIGNCD 311. Overlaid on modified DESIGNCD 325. Only the first 5 points (trees ≥5 inches DBH) and first 3 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured.
[b]NRS-NC	321	DESIGNCD 1. Overlaid on modified DESIGNCD 325. Only the first 5 points (trees ≥5 inches DBH) and first 3 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured.
[b]NRS-NC	322	DESIGNCD 311. Overlaid on DESIGNCD 327. Only the first 5 points (trees ≥5 inches DBH) and first 3, 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured.
[b]NRS-NC	323	DESIGNCD 1. Overlaid on DESIGNCD 327. Only the first 5 points (trees ≥5 inches DBH) and first 3 1/300 acre plots (trees ≥1 and <5 inches DBH) are remeasured.
[b]NRS-NC	325	Ten variable-radius, 37.5 BAF points, 70 feet apart, for trees ≥5 inches DBH and 10, 1/300 acre plots for seedlings and trees ≥1 and <5 inches DBH. Point and plot center were coincident. Conditions were not mapped. Instead, points were rotated into forest or nonforest based on the condition at point center.
[b]NRS-NC	326	Ten variable-radius, 37.5 BAF points, 70 feet apart, for trees ≥5 and <17.0 inches DBH, 10 1/24 acre plots for trees ≥17.0 inches DBH, and 10, 1/300 acre plots for seedlings and trees ≥1 and <5 inches DBH. Point and plot center were coincident. Conditions were mapped.
[b]NRS-NC	327	Ten variable-radius, 37.5 BAF points, 70 feet apart, for trees ≥5 inches DBH and 10, 1/300 acre plots for seedlings and trees ≥1 and <5 inches DBH. Point and plot center were coincident. Conditions were not mapped. Instead, points were rotated into forest or nonforest based on the condition at point center. Diameters were estimated with a model, but all dead and cut trees were recorded.
[b]NRS-NC	328	DESIGNCD 1. Overlaid on DESIGNCD 311. All trees and saplings are remeasured.
[c]SRS	210	Other plot design installed by previous research stations within the 13-State Southern area not described by DESIGNCD 211-219.
[c]SRS	211	Ten variable-radius, 37.5 BAF points, 70 feet apart. Remeasure first 3 points of same design or new/replacement plot.
[c]SRS	212	Five variable-radius, 37.5 BAF points, 70 feet apart. Remeasure first 5 points of DESIGNCD 211 or new/replacement plot.
[c]SRS	213	Five variable-radius, 37.5 BAF points, 70 feet apart. Remeasure DESIGNCD 212.
[c]SRS	214	Ten variable-radius, 37.5 BAF points, 66 feet apart. Remeasure same design or new/replacement plot.
[c]SRS	215	Five variable-radius, 37.5 BAF points, 66 feet apart. Remeasure first 5 points of DESIGNCD 214 or new/replacement plot.
[c]SRS	216	Ten variable-radius, 37.5 BAF points, 66 feet apart. Remeasure DESIGNCD 215.
[c]SRS	217	Five point cluster plot, point 1 is 1/5th acre sawtimber plot and 1/10th acre poletimber plot, points 2-5 are 37.5 BAF prism points. No remeasurement.

FIA work unit	Plot design code (DESIGNCD)	Definition
[c]SRS	218	Remeasurement of DESIGNCD 217, point 1 only. Used only for change estimates.
[c]SRS	219	Three point, 2.5 BAF metric prism plot, points 25 meters apart. Remeasure same design or new/replacement plot.
[c]SRS	220	Four 1/24 acre plots for trees ≥5 inches DBH and 4, 1/300 acre plots for seedlings and trees ≥1 and <5 inches DBH. The 1/24 acre and 1/300 acre plots have common centers. Conditions are mapped and boundaries may be within the plots. Remeasurement plot not described by 221-229.
[c]SRS	221	DESIGNCD 220. Remeasure same design or new/replacement plot.
[c]SRS	222	DESIGNCD 220. Overlaid on and remeasurement of DESIGNCD 212 or 213.
[c]SRS	223	DESIGNCD 220. Overlaid on and remeasurement of first 5 points of DESIGNCD 214 or 216.
[c]SRS	230	DESIGNCD 1. Remeasurement plot not described by DESIGNCD 231-239.
[c]SRS	231	DESIGNCD 1. Overlaid on and remeasurement of DESIGNCD 212 or DESIGNCD 213.
[c]SRS	232	DESIGNCD 1. Overlaid on and remeasurement of first 5 points of DESIGNCD 214 or 216.
[c]SRS	233	DESIGNCD 1. Overlaid on and remeasurement of DESIGNCD 220, 221, 222, or 223
[c]SRS	240	DESIGNCD 1. Collected in metric and converted to English in the database. Remeasurement not described by 241-249.
[c]SRS	241	DESIGNCD 1. Collected in metric and converted to English in the database. Remeasure same design or new/replacement plot.
[c]SRS	242	DESIGNCD 1. Overlaid on and remeasurement of DESIGNCD 219. Collected in metric and converted to English in the database.
[c]SRS	299	Other plot design not described in DESIGNCD 200-298.
[d]RMRS	403	One 1/10th acre fixed-radius plot divided into 4 quadrants and four 1/300th acre fixed-radius microplots. Timber and woodland tree species <5.0 inches DRC tallied on microplot.
[d]RMRS	404	One 1/20th acre fixed-radius plot divided into 4 quadrants and four 1/300th acre fixed-radius microplots. Timber and woodland tree species <5.0 inches DRC tallied on microplot.
[d]RMRS	405	One 1/5th acre fixed-radius plot divided into 4 quadrants and four 1/300th acre fixed-radius microplots. Timber and woodland tree species <5.0 inches DRC tallied on microplot.
[d]RMRS	410	40 BAF variable-radius plots and 1/300th acre fixed-radius microplots; number of microplots = number of points installed. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	411	40 BAF variable-radius plots and 1/300th acre fixed-radius microplots; 3 microplots installed on points 1, 2, and 3. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	412	40 BAF variable-radius plots and 1/300th acre fixed-radius microplots; 3 microplots installed on points 1, 2, and 5. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	413	20 BAF variable-radius plots and 1/300th acre fixed-radius microplots; number of microplots = number of points installed. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	414	20 BAF variable-radius plots and 1/300th acre fixed-radius microplots; 3 microplots installed on points 1, 2, and 3. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.

FIA work unit	Plot design code (DESIGNCD)	Definition
[d]RMRS	415	20 BAF variable-radius plots and 1/300th acre fixed-radius microplots; 3 microplots installed on points 1, 2, and 5. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	420	One 1/10th acre fixed-radius plot and one centered 1/100th acre microplot. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	421	One 1/20th acre fixed-radius plot and one centered 1/100th acre microplot. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	422	One 1/5th acre fixed-radius plot and one centered 1/100th acre microplot. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	423	One 1/10th acre fixed-radius plot divided into 4 quadrants and four 1/300th acre fixed-radius microplots. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	424	One 1/20th acre fixed-radius plot divided into 4 quadrants and four 1/300th acre fixed-radius microplots. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[d]RMRS	425	One 1/5th acre fixed-radius plot divided into 4 quadrants and four 1/300th acre fixed-radius microplots. Timber tree species <5.0 inches DBH; woodland tree species <3.0 inches DRC measured on microplot.
[e]PNWRS	501	DESIGNCD 1 with optional macroplot. Trees ≥24 inches DBH are tallied on macroplot.
[e]PNWRS	502	DESIGNCD 1 with optional macroplot. Trees ≥30 inches DBH are tallied on macroplot.
[e]PNWRS	503	DESIGNCD 1 with optional macroplot. Trees ≥ 4 inches DBH are tallied on macroplot. Trees ≥32 inches DBH are tallied on one 1-hectare plot.
[e]PNWRS	504	DESIGNCD 1 with optional macroplot. Trees ≥24 inches DBH are tallied on macroplot. Trees ≥48 inches DBH are tallied on one 1-hectare plot.
[e]PNWRS	505	DESIGNCD 1 with optional macroplot. Trees ≥30 inches DBH are tallied on macroplot. Trees ≥48 inches DBH are tallied on one 1-hectare plot.
[e]PNWRS	550	Five 30.5 BAF points for trees ≥5 inches and <35.4 inches DBH; five 55.8 foot fixed-radius plots for trees ≥35.4 inches DBH; and five 7.7-foot fixed-radius plots for seedlings and saplings <5 inches DBH. Point and plot centers are coincident. Conditions are mapped.
[e]PNWRS	551	Five 20 BAF points for trees ≥5 inches and <35.4 inches DBH; five 55.6 foot fixed-radius plots for trees ≥35.4 inches DBH; and five 9.7-foot fixed-radius plots for seedlings and saplings <5 inches DBH. Point and plot centers are coincident. Conditions are mapped.
[e]PNWRS	552	Five 30 BAF points for trees ≥5 inches and <35.4 inches DBH; five 55.6-foot fixed-radius plots for trees ≥35.4 inches DBH; and five 7.9-foot fixed-radius plots for seedlings and saplings <5 inches DBH. Point and plot centers are coincident. Conditions are mapped.
[e]PNWRS	553	Four 1/24 acre plots for live trees and four 58.9-foot fixed-radius plots for trees ≥11.8 inches DBH. Plot centers are coincident. Conditions are mapped.
[e]PNWRS	554	Four 1/24 acre plots for live trees and four 58.9-foot fixed-radius plots for trees ≥19.7 inches DBH. Plot centers are coincident. Conditions are mapped.
[e]PNWRS	555	Five 30.5 BAF points for trees ≥6.9 inches and <35.4 inches DBH; five 55.8-foot fixed-radius plots for trees ≥35.4 inches DBH; and five 10.8-foot fixed-radius plots for seedlings and saplings <6.9 inches DBH. Point and plot centers are coincident. Conditions are mapped.
[e]PNWRS	556	Five 30.5 BAF points for trees ≥6.9 inches and <35.4 inches DBH; five

FIA work unit	Plot design code (DESIGNCD)	Definition
		55.8-foot fixed-radius plots for trees ≥35.4 inches DBH; five 10.8-foot fixed-radius plots for saplings ≥5 inches and <6.9 inches DBH; and the northeast quadrant of each of the five 10.8-foot fixed-radius plots for trees <5 inches DBH. Point and plot centers are coincident. Conditions are not mapped.
[e]PNWRS	557	Five 40 BAF points for trees ≥5 inches DBH; and five 6.9-foot fixed-radius plots for saplings ≥1 and <5 inches DBH. Point and plot centers are coincident. Conditions are not mapped.
[e]PNWRS	558	Three 30.5 BAF points for trees ≥6.9 inches and <35.4 inches DBH; three 55.8-foot fixed-radius plots for trees ≥35.4 inches DBH; three 10.8-foot fixed-radius plots for saplings ≥5 inches and <6.9 inches DBH; and the northeast quadrant of each of the three 10.8-foot fixed-radius plots for trees <5 inches DBH. Point and plot centers are coincident. Conditions are mapped, only condition class 1 measured. Overlaid on and remeasurement of same design.
[e]PNWRS	559	Four 40 BAF points for trees ≥5 inches DBH; and four 6.9-foot fixed-radius plots for saplings ≥1 and <5 inches DBH. Point and plot centers are coincident. Conditions are mapped, only condition class 1 measured. Overlaid on and remeasurement of same design.
[e]PNWRS	601	South East Coastal Alaska periodic grid plot design. Similar to DESIGNCD 1 with exceptions including: subplots are 7.3 m (23.95 foot) fixed-radius; the four microplots are 2.0 m (6.56 foot) fixed-radius and are centered on each subplot; subplots 2, 3, and 4 are spaced 36.6 m (120.08 feet) from subplot 1, at azimuths of 360, 120, and 240, respectively; condition classes are based on forest stand origin, forest stand size, and forest density in 10% classes; not all annual attributes were collected and additional non-annual attributes were collected.
[e]PNWRS	602	South Central Coastal Alaska periodic grid plot design, similar to DESIGNCD 601 except for variations in annual and non-annual attributes collected.
[e]PNWRS	603	South Central Coastal Alaska periodic grid plot design for Kodiak and Afognak islands. Similar to DESIGNCD 602 except for reduced (one quarter) sampling intensity.
[a]NRS-NE, [b]NRS-NC, [c]SRS, [d]RMRS, [e]PNWRS	999	A plot record created to represent reserved or other nonsampled or undersampled areas where there were no ground plots; the plot has no design type; rather, it is a placeholder for area estimates. In all cases where DESIGNCD 999 plots are present, they are only used for estimates of area; they are not used in estimates of numbers of trees, volume or change (e.g., tree-level estimates).

[a]Northern Research Station – previously Northeastern
[b]Northern Research Station – previously North Central
[c]Southern Research Station
[d]Rocky Mountain Research Station
[e]Pacific Northwest Research Station

Other acronyms and definitions:
BAF – basal area factor
DRC – diameter at root collar
Sawtimber-sized trees – softwoods ≥9 inches DBH, hardwoods ≥11 inches DBH.
Poletimber-sized trees – softwoods ≥5 inches and <9 inches DBH, hardwoods ≥5 inches and <11 inches DBH

Appendix J. Damage Codes and Thresholds

CODE	Category	Agent	Common Name	Scientific Name	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			
10002	10	002	Pine tip moth			
10003	10	003	wasp			
10004	10	004	Chinese rose beetle	Adoretus sinicus		
10005	10	005	rose beetle	Adoretus versutus		
10006	10	006	coconut hispid beetle	Brontispa longissima		
10007	10	007	clerid beetle	Cleridae		
10008	10	008	weevil	Curculionidae		
10009	10	009	green rose chafer	Dichelonyx backi		
10010	10	010	Allegheny mound ant	Formica exsectoides		
10011	10	011	ant	Formicidae		
10012	10	012	stick insect	Graeffea crovanii		
10013	10	013	Hulodes cranea	Hulodes cranea		
10014	10	014	conifer swift moth	Korsheltellus gracilis		
10015	10	015	Caroline shortnosed weevil	Lophothetes spp.		
10016	10	016	coconut rhinoceros beetle	Oryctes rhinoceros		
10017	10	017	bagworm moth	Psychidae	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		
10019	10	019	scarab	Scarabaeidae		
10020	10	020	ash white fly	Siphoninus phillyreae		
10021	10	021	conifer seedling weevil	Steremnius carinatus		
10022	10	022	pyralid moth	Thliptoceras octoquttale		
10023	10	023	wood wasps	Siricidae spp.		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
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		
11002	11	002	western pine beetle	Dendroctonus brevicomis		
11003	11	003	southern pine beetle	Dendroctonus frontalis	Any occurrence	**SRS**
11004	11	004	Jeffery pine beetle	Dendroctonus jeffreyi		
11005	11	005	lodgepole pine beetle	Dendroctonus murrayanae		
11006	11	006	mountain pine beetle	Dendroctonus ponderosae	Any evidence of a successful attack	**IW**
11007	11	007	Douglas-fir beetle	Dendroctonus pseudotsugae		
11008	11	008	Allegheny spruce beetle	Dendroctonus punctatus		
11009	11	009	spruce beetle	Dendroctonus rufipennis	Any evidence of a successful attack	**IW; PNW**
11010	11	010	eastern larch beetle	Dendroctonus simplex		
11011	11	011	black turpentine beetle	Dendroctonus terebrans	Any evidence of a successful attack	**SRS**
11012	11	012	red turpentine beetle	Dendroctonus valens		
11013	11	013	Dryocoetes affaber	Dryocoetes affaber		
11014	11	014	Dryocoetes autographus	Dryocoetes autographus		
11015	11	015	western balsam bark beetle	Dryocoetes confusus		
11016	11	016	Dryocoetes sechelti	Dryocoetes sechelti		
11017	11	017	ash bark beetles	Hylesinus spp.		
11018	11	018	native elm bark beetle	Hylurgopinus rufipes		
11019	11	019	pinon ips	Ips confusus		
11020	11	020	small southern pine engraver	Ips avulsus		
11021	11	021	sixspined ips	Ips calligraphus		
11022	11	022	emarginate ips	Ips emarginatus		
11023	11	023	southern pine engraver beetle	Ips grandicollis		
11024	11	024	Orthotomicus latidens	Orthotomicus latidens		
11025	11	025	Arizona five-spined ips	Ips lecontei		
11026	11	026	Monterey pine ips	Ips mexicanus		
11027	11	027	California fivespined ips	Ips paraconfusus		
11028	11	028	northern spruce engraver	Ips perturbatus		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
			beetle			
11029	11	029	pine engraver	Ips pini		
11030	11	030	Ips engraver beetles	Ips spp.	Any evidence of a successful attack	**IW; SRS**
11031	11	031	Ips tridens	Ips tridens		
11032	11	032	western ash bark beetle	Leperisinus californicus		
11033	11	033	Oregon ash bark beetle	Leperisinus oregonus		
11034	11	034	Orthotomicus caelatus	Orthotomicus caelatus		
11035	11	035	cedar bark beetles	Phloeosinus spp.		
11036	11	036	western cedar bark beetle	Phloeosinus punctatus		
11037	11	037	tip beetles	Pityogenes spp.		
11038	11	038	Douglas-fir twig beetle	Pityophthorus pseudotsugae		
11039	11	039	twig beetles	Pityophthorus spp.		
11040	11	040	foureyed spruce bark beetle	Polygraphus rufipennis		
11041	11	041	fir root bark beetle	Pseudohylesinum granulatus		
11042	11	042	Pseudohylesinus dispar	Pseudohylesinus dispar		
11043	11	043	Douglas-fir pole beetle	Pseudohylesinus nebulosus		
11044	11	044	silver fir beetle	Pseudohylesinus sericeus		
11045	11	045	small European elm bark beetle	Scolytus multistriatus		
11046	11	046	spruce engraver	Scolytus piceae		
11047	11	047	hickory bark beetle	Scolytus quadrispinosus		
11048	11	048	true fir bark beetles	Scolytus spp.		
11049	11	049	Douglas-fir engraver	Scolytus unispinosus		
11050	11	050	fir engraver	Scolytus ventralis		
11051	11	051	striped ambrosia beetle	Tryachykele lineatum		
11052	11	052	Sitka spruce engraver beetle	Ips conncinnus		
11053	11	053	four-eyed bark beetle	Polygraphus spp.		
11054	11	054	hemlock beetle	Pseudohylesinus tsugae		
11055	11	055	spruce ips	Ips pilifrons		
11056	11	056	(smaller) Mexican pine beetle	Dendroctonus mexicanus		
11057	11	057	banded elm bark beetle	Scolytus schevyrewi		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
11058	11	058	redbay ambrosia beetle	Xyleborus glabratus		
11059	11	059	southern cypress beetle	Phloeosinus taxodii		
11060	11	060	Mediterranean pine engraver	Orthotomicus erosus		
11800	11	800	other bark beetle (known)	other bark beetle (known)		
11900	11	900	unknown bark beetle	unknown bark beetle		
11999	11	999	western bark beetle complex	western bark beetle complex		
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			
12002	12	002	leaftier			
12003	12	003	loopers			
12004	12	004	needleminers			
12005	12	005	sawflies			
12006	12	006	skeletonizer			
12007	12	007	larger elm leaf beetle	Monocesta coryli		
12008	12	008	spanworm			
12009	12	009	webworm			
12010	12	010	pine false webworm	Acantholyda erythrocephala		
12011	12	011	western blackheaded budworm	Acleris gloverana		
12012	12	012	eastern blackheaded budworm	Acleris variana		
12013	12	013	whitefly	Aleyrodoidae		
12014	12	014	fall cankerworm	Alsophila pometaria		
12015	12	015	alder flea beetle	Altica ambiens		
12016	12	016	mountain mahogany looper	Anacamptodes clivinaria profanata		
12017	12	017	birch leaffolder	Ancylis disigerana		
12018	12	018	oak worms	Anisota spp.		
12019	12	019	orange-striped oakworm	Anisota senatoria		
12020	12	020	western larch sawfly	Anoplonyx occidens		
12021	12	021	fruittree leafroller	Archips argyrospila		
12022	12	022	uglynest caterpillar	Archips cerasivorana		
12023	12	023	boxelder defoliator	Archips negundanus		
12024	12	024	oak leafroller	Archips semiferana		
12025	12	025	birch sawfly	Arge pectoralis		
12026	12	026	arborvitae leafminer	Argyresthia thuiella		
12027	12	027	coconut scale	Aspidiotus destructor		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
12028	12	028	texas leafcutting ant	Atta texana	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
12029	12	029	oak skeletonizer	Bucculatrix ainsliella		
12030	12	030	pear sawfly	Caliroa cerasi		
12031	12	031	scarlet oak sawfly	Caliroa quercuscoccineae		
12032	12	032	elm calligrapha	Calligrapha scalaris		
12033	12	033	boxelder leafroller	Caloptilia negundella		
12034	12	034	maple petiole borer	Caulocampus acericaulis		
12035	12	035	spruce webspinning sawfly	Cephalcia fascipennis		
12036	12	036	two-year budworm	Choristoneura biennis		
12037	12	037	large aspen tortrix	Choristoneura conflictana		
12038	12	038	spruce budworm	Choristoneura fumiferana	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		
12040	12	040	western spruce budworm	Choristoneura occidentalis	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**IW, PNW**
12041	12	041	jack pine budworm	Choristoneura pinus	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12042	12	042	Modoc budworm	Choristoneura retiniana		
12043	12	043	aspen leaf beetle	Chrysomela crotchi		
12044	12	044	cottonwood leaf beetle	Chrysomela scripta		
12045	12	045	leafhopper	Cicadellidae		
12046	12	046	poplar tentmaker	Clostera inclusa		
12047	12	047	larch casebearer	Coleophora laricella		
12048	12	048	birch casebearer	Coleophora serratella		
12049	12	049	lodgepole needleminer	Coleotechnites milleri		
12050	12	050	Gelechiid moths/ needleminers	Coleotechnites spp.		
12051	12	051	Black Hills pandora moth	Coloradia doris		
12052	12	052	pandora moth	Coloradia pandora		
12053	12	053	sycamore lace bug	Corythucha ciliata		
12054	12	054	lace bugs	Corythucha spp.		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
12055	12	055	oak leaftier	Croesia semipurpurana		
12056	12	056	dusky birch sawfly	Croesus latitarsus		
12057	12	057	walnut caterpillar	Datana integerrima		
12058	12	058	yellownecked caterpillar	Datana ministra		
12059	12	059	walkingstick	Diapheromera femorata		
12060	12	060	spruce coneworm	Dioryctria reniculelloides		
12061	12	061	introduced pine sawfly	Diprion similis		
12062	12	062	greenstriped mapleworm	Dryocampa rubicunda		
12063	12	063	spruce needleminer (east)	Endothenia albolineana		
12064	12	064	elm spanworm	Ennomos subsignaris	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		
12066	12	066	white fir needleminer	Epinotia meritana		
12067	12	067	linden looper	Erannis tiliaria		
12068	12	068	browntail moth	Euproctis chrysorrhoea		
12069	12	069	pine needleminer	Exoteleia pinifoliella		
12070	12	070	birch leafminer	Fenusa pusilla		
12071	12	071	elm leafminer	Fenusa ulmi		
12072	12	072	geometrid moth	Geometridae		
12073	12	073	leafblotch miner	Gracillariidae		
12074	12	074	spotted tussock moth	Halisidota maculata		
12075	12	075	pale tussock moth	Halysidota tessellaris		
12076	12	076	hesperiid moth	Hasora choromus		
12077	12	077	brown day moth	Hemileuca eglanterina		
12078	12	078	buck moth	Hemileuca maia		
12079	12	079	saddled prominent	Heterocampa guttivitta		
12080	12	080	variable oakleaf caterpillar	Heterocampa manteo		
12081	12	081	cherry scallop shell moth	Hydria prunivorata	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
12082	12	082	fall webworm	Hyphantria cunea	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
12083	12	083	hemlock looper	Lambdina fiscellaria		
12084	12	084	oak looper	Lambdina punctat		
12085	12	085	tent caterpillar moth	Lasiocampidae		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
12086	12	086	satin moth	Leucoma salicis		
12087	12	087	willow leafblotch miner	Lithocolletis spp.		
12088	12	088	aspen blotchminer	Lithocolletis tremuloidiella		
12089	12	089	gypsy moth	Lymantria dispar	Any occurrence	**NRS; SRS**
12090	12	090	cottonwood leafminers	Lyonetia spp.		
12091	12	091	dogwood sawfly	Macremphytus tarsatus		
12092	12	092	rose chafer	Macrodactylus subspinosus		
12093	12	093	eastern tent caterpillar	Malacosoma americanum	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**NRS; SRS**
12094	12	094	western tent caterpillar	Malacosoma californicum		
12095	12	095	Pacific tent caterpillar	Malacosoma constrictum		
12096	12	096	forest tent caterpillar	Malacosoma disstria	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected.	**NRS**
12097	12	097	southwestern tent caterpillar	Malacosoma incurvum		
12098	12	098	leafcutting bees	Megachilidae		
12099	12	099	blister beetle	Meloidae		
12100	12	100	early birch leaf edgeminer	Messa nana		
12101	12	101	juniper sawfly	Monoctenus fulvus		
12102	12	102	common sawflies	Nematus spp.		
12103	12	103	balsam fir sawfly	Neodiprion abietis		
12104	12	104	lodgepole sawfly	Neodiprion burkei		
12105	12	105	blackheaded pine sawfly	Neodiprion excitans		
12106	12	106	pine infesting sawflies	Neodiprion fulviceps		
12107	12	107	redheaded pine sawfly	Neodiprion lecontei		
12109	12	109	ponderosa pine sawfly	Neodiprion mundus		
12110	12	110	white pine sawfly	Neodiprion pinetum		
12111	12	111	jack pine sawfly	Neodiprion pratti banksianae		
12112	12	112	Virginia pine sawfly	Neodiprion pratti pratti		
12113	12	113	European pine sawfly	Neodiprion sertifer		
12114	12	114	loblolly pine sawfly	Neodiprion taedae linearis		
12115	12	115	hemlock sawfly	Neodiprion tsugae		
12116	12	116	pine butterfly	Neophasia menapia		
12117	12	117	false hemlock looper	Nepytia canosaria		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
12118	12	118	California tortoiseshell	Nymphalis californica		
12119	12	119	locust leafminer	Odontota dorsalis		
12120	12	120	Bruce spanworm	Operophtera bruceata		
12121	12	121	rusty tussock moth	Orgyia antiqua		
12122	12	122	whitemarked tussock moth	Orgyia leucostigma		
12123	12	123	Douglas-fir tussock moth	Orgyia pseudotsugata		
12124	12	124	western tussock moth	Orgyia vetusta		
12125	12	125	spring cankerworm	Paleacrita vernata		
12126	12	126	black citrus swallowtail butterfly	Papilio polytes		
12127	12	127	maple leafcutter	Paraclemensia acerifoliella		
12128	12	128	pine tussock moth	Parorgyia grisefacta		
12129	12	129	poinciana looper	Pericyma cruegeri		
12130	12	130	half-wing geometer	Phigalia titea		
12131	12	131	Phoberia moth	Phoberia atomaris		
12132	12	132	California oakworm	Phryganidia californica		
12133	12	133	European snout beetle	Phyllobius oblongus		
12134	12	134	citrus leafminer	Phyllocnistis citrella		
12135	12	135	aspen leafminer	Phyllocnistis populiella		
12136	12	136	yellowheaded spruce sawfly	Pikonema alaskensis		
12137	12	137	tenlined June beetle	Polyphylla decemlineata		
12138	12	138	Japanese beetle	Popillia japonica		
12139	12	139	larch sawfly	Pristiphora erichsonii		
12140	12	140	mountain-ash sawfly	Pristiphora geniculata		
12141	12	141	elm leaf beetle	Pyrrhalta luteola		
12142	12	142	spearmarked black moth	Rheumaptera hastata		
12143	12	143	giant silkworm moth	Saturniidae		
12144	12	144	redhumped caterpillar	Schizura concinna		
12145	12	145	redbanded thrips	Selenothrips rubrocinctus		
12146	12	146	green larch looper	Semiothisa sexmaculata		
12147	12	147	maple leafroller	Sparganothis acerivorana		
12148	12	148	redhumped oakworm	Symmerista canicosta		
12149	12	149	orangehumped mapleworm	Symmerista leucitys		
12150	12	150	spruce needleminer (west)	Taniva albolineana		
12151	12	151	maple webworm	Tetralopha asperatella		
12152	12	152	pine webworm	Tetralopha robustella		
12153	12	153	introduced basswood thrips	Thrips calcaratus		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
12154	12	154	bagworm	Thyridopteryx ephemeraeformis	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
12155	12	155	leafroller/seed moth	Tortricidae		
12156	12	156	willow defoliation	Tortricidae		
12157	12	157	euonymus caterpillar	Yponomeuta spp.		
12158	12	158	spruce bud moth	Zeiraphera canadensis		
12159	12	159	larch bud moth	Zeiraphera improbana		
12160	12	160	pine needle sheathminer	Zelleria haimbachi		
12161	12	161	cypress looper	Anacamptodes pergracilis		
12162	12	162	Chrysomela leaf beetle	Chrysomela spp.		
12163	12	163	pine colaspis	Colaspis pini		
12164	12	164	saddleback looper	Ectropis crepuscularia		
12165	12	165	birch leaf roller	Epinotia solandriana		
12166	12	166	New Mexico fir looper	Galenara consimilis		
12167	12	167	striped alder sawfly	Hemichroa crocea		
12168	12	168	greenstriped looper	Melanoplophia imitata		
12169	12	169	willow leaf blotchminer	Micrurapteryx salicifoliella		
12170	12	170	pine sawfly	Neodiprion autmnalis		
12171	12	171	pinon sawfly	Neodiprion edulicolus		
12172	12	172	Neodiprion gilletti	Neodiprion gilletti		
12173	12	173	Neodiprion ventralis	Neodiprion ventralis		
12174	12	174	pine looper	Phaeoura mexicanaria		
12175	12	175	Zadiprion rohweri	Zadiprion rohweri		
12176	12	176	bull pine sawfly	Zadiprion townsendi		
12177	12	177	Douglas-fir budmoth	Zeiraphera hesperiana		
12178	12	178	western oak looper	Lambdina fiscellaria somniaria		
12179	12	179	phantom hemlock looper	Nepytia phantasmaria		
12180	12	180	tent caterpillar	Malacosoma spp.		
12181	12	181	Abbot's sawfly	Neodiprion abbotii		
12182	12	182	slash pine sawfly	Neodiprion merkeli		
12183	12	183	sand pine sawfly	Neodiprion pratti		
12184	12	184	melalueca leaf weevil	Oxyops vitiosa		
12185	12	185	cypress leaf beetle	Systena marginalis		
12186	12	186	Nepytia janetae	Nepytia janetae		
12187	12	187	agromyzid fly	Agromyza viridula		
12188	12	188	elm sawfly	Cimbex americana		
12189	12	189	june beetle	Phyllophaga spp.		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
12190	12	190	hickory tussock moth	Halisidota caryae		
12191	12	191	pin oak sawfly	Caliroa lineata		
12192	12	192	palmerworm	Dichomeris ligulella		
12193	12	193	pitch pine looper	Lambdina athasaria pellucidaria		
12194	12	194	red pine sawfly	Neodiprion nanulus nanulus		
12195	12	195	pine tube moth	Argyrotaenia pinatubana		
12196	12	196	baldcypress leafroller	Archips goyerana		
12197	12	197	winter moth	Operophtera brumata		
12198	12	198	basswood thrips	Neohydatothrips tiliae		
12199	12	199	noctuid moth	Xylomyges simplex (Walker)		
12200	12	200	pyralid moth	Palpita magniferalis		
12201	12	201	pacific silver fir budmoth	Zeiraphera spp.		
12202	12	202	red pine needle midge	Thecodiplosis piniresinosae		
12203	12	203	western hemlock looper	Lambdina fiscellaria lugubrosa		
12204	12	204	lodgepole pine sawfly	Neodiprion nanulus contortae		
12205	12	205	silverspotted tiger moth	Lophocampa argentata		
12206	12	206	green alder sawfly	Monsoma pulveratum		
12207	12	207	conifer sawflies	conifer sawflies		
12208	12	208	ambermarked birch leafminer	Profenusa thomsoni		
12209	12	209	cycad blue butterfly	Chilades pandava		
12300	12	300	budworm	budworms	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)		
12900	12	900	unknown defoliator	unknown defoliator		
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			
13002	13	002	shorthorn grasshoppers	Acrididae		
13003	13	003	black cutworm	Agrotis ipsilon		
13004	13	004	Palau coconut beetle	Brontispa palauenis		
13005	13	005	clearwinged grasshopper	Camnula pellucida		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
13006	13	006	cicadas	Cicadidae	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
13007	13	007	eurytomids	Eurytoma spp.		
13008	13	008	cutworms	Euxoa excellens		
13009	13	009	whitefringed beetles	Graphognathus spp.		
13010	13	010	pales weevil	Hylobius pales	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
13011	13	011	vegetable weevil	Listroderes difficilis		
13012	13	012	periodical cicada	Magicicada septendecim		
13013	13	013	migratory grasshopper	Melanoplus sanguinipes		
13014	13	014	valley grasshopper	Oedaleonotus enigma		
13015	13	015	strawberry root weevil	Otiorhyhchus ovatus		
13016	13	016	black vine weevil	Otiorhynchus sulcatus		
13017	13	017	pandanus beetle	Oxycephala pandani		
13018	13	018	spaeth pandanus	Oxycephala spaethi		
13019	13	019	agamemnon butterfly	Papilio agememnon		
13020	13	020	northern pitch twig moth	Petrova albicapitana		
13021	13	021	ponderosa pine tip moth	Rhyacionia zozana		
13022	13	022	pine needle weevil	Scythropus spp.		
13023	13	023	coconut longhorned grasshopper	Segestes unicolor		
13024	13	024	clover root curculio	Sitona hispidulus		
13025	13	025	Madron thrips	Thrips madronii		
13026	13	026	ash plant bug	Tropidosteptes amoenus		
13027	13	027	shorthorned grasshopper	Valanga nigricornis		
13028	13	028	pitch-eating weevil	Pachylobius picivorus		
13029	13	029	eastern pine weevil	Pissodes nemorensis		
13030	13	030	adana tip moth	Rhyacionia adana		
13800	13	800	other chewing insect (known)	other chewing insect (known)		
13900	13	900	unknown chewing insect	unknown chewing insect		
14000	**14**	**000**	**Sucking Insects**		Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
14001	14	001	scale insects			
14002	14	002	western larch woolly aphid	Adelges oregonensis		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
14003	14	003	balsam woolly adelgid	Adelges piceae	Any occurrence	**ALL**
14004	14	004	hemlock woolly adelgid	Adelges tsugae	Any occurrence	**NRS; SRS; IW**
14005	14	005	spiraling whitefly	Aleurodicus dispersus		
14006	14	006	aphid	Aphididae		
14007	14	007	pine spittlebug	Aphrophora parallela		
14008	14	008	western pine spittlebug	Aphrophora permutata		
14009	14	009	Saratoga spittlebug	Aphrophora saratogensis		
14010	14	010	spittlebug	Cercopidae		
14011	14	011	wax scale	Ceroplastes spp.		
14012	14	012	pine needle scale	Chionaspis pinifoliae		
14014	14	014	giant conifer aphids	Cinara spp.		
14015	14	015	white pine aphid	Cinara strobi		
14016	14	016	beech scale	Cryptococcus fagisuga	Any occurrence	**NRS**
14017	14	017	spruce aphid	Elatobium abietinum		
14018	14	018	woolly apple aphid	Eriosoma lanigerum		
14019	14	019	striped mealybug	Ferrisia vergata		
14020	14	020	elongate hemlock scale	Fiorinia externa	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
14021	14	021	coconut red scale	Furcaspis oceanica		
14022	14	022	pine thrips	Gnophothrips spp.		
14023	14	023	leucaena psyllid	Heteropsylla cubana		
14024	14	024	honeysuckle aphids	Hyadaphis tataricae		
14025	14	025	Egyptian fluted scale	Icerya aegyptiaca		
14026	14	026	Lecanium scale	Lecanium spp.		
14027	14	027	common falsepit scale	Lecanodiaspis prosopidis		
14028	14	028	oystershell scale	Lepidosaphes ulmi		
14029	14	029	pinyon needle scale	Matsucoccus acalyptus		
14030	14	030	ponderosa pine twig scale	Matsucoccus bisetosus		
14031	14	031	pine twig scale	Matsucoccus californicus		
14032	14	032	ponderosa pine scale	Matsucoccus degeneratus		
14033	14	033	red pine scale	Matsucoccus resinosae		
14034	14	034	Prescott scale	Matsucoccus vexillorum		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
14035	14	035	treehoopers	Membracidae		
14036	14	036	hibiscus psyllid	Mesohomotoma hibisci		
14037	14	037	balsam twig aphid	Mindarus abietinus		
14038	14	038	hibiscus mealybug	Nipaecoccus vastator		
14039	14	039	black pineleaf scale	Nuculaspis californica		
14040	14	040	spruce spider mite	Oligonychus ununquis		
14041	14	041	twig girdler	Oncideres cingulata	Any damage to the terminal leader; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
14042	14	042	woolly alder aphid	Paraprociphilus tessellatus		
14043	14	043	maple aphids	Periphyllus spp.		
14044	14	044	spruce bud scale	Physokermes piceae		
14045	14	045	red pine adelgid	Pineus borneri		
14046	14	046	pine leaf adelgid	Pineus pinifoliae		
14047	14	047	white pine adelgid	Pineus spp.		
14048	14	048	pine bark adelgid	Pineus strobi		
14049	14	049	root aphid	Prociphilus americanus		
14050	14	050	mealybug	Pseudococcidae		
14051	14	051	cottony maple scale	Pulvinaria innumerabilis		
14052	14	052	fir mealybug	Puto cupressi		
14053	14	053	Douglas-fir mealybug	Puto profusus		
14054	14	054	spruce mealybug	Puto sandini		
14055	14	055	hemispherical scale	Saissetia coffeae		
14056	14	056	woolly pine needle aphid	Schizolachnus piniradiatae		
14057	14	057	steatococcus scale	Steatococcus samaraius		
14058	14	058	pear thrips	Taeniothrips inconsequens		
14059	14	059	mulberry whitefly	Tetraleurodes mori		
14060	14	060	tuliptree scale	Toumeyella liriodendri		
14061	14	061	pine tortoise scale	Toumeyella parvicornis		
14062	14	062	citrus snow scale	Unaspis citri		
14063	14	063	birch aphid	Euceraphis betulae		
14064	14	064	Kermes scale	Allokermes spp.		
14065	14	065	Casuarina spittlebug	Clastoptera undulata		
14066	14	066	giant bark aphid	Longistigma caryae		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
14067	14	067	woolly pine scale	Pseudophilippia quaintancii		
14068	14	068	european elm scale	Gossyparia spuria		
14069	14	069	elm scurfy scale	Chionaspis americana		
14070	14	070	magnolia scale	Neolecanium cornuparvum		
14071	14	071	beech blight aphid	Grylloprociphilus imbricator		
14072	14	072	beech woolly aphid	Phyllaphis fagi		
14073	14	073	Asian cycad scale	Aulacaspis yasumatsui		
14074	14	074	European fruit lecanium scale	Parthenolecanium corni		
14075	14	075	lobate lac scale	Paratachardina lobata		
14800	14	800	other sucking insect (known)	other sucking insect (known)		
14900	14	900	unknown sucking insect	unknown sucking insect		
15000	**15**	**000**	**Boring Insects**		Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches	**ALL**
15001	15	001	shoot borer			
15002	15	002	termite			
15003	15	003	ponderosa pine bark borer	Acanthocinus princeps		
15004	15	004	bronze birch borer	Agrilus anxius		
15005	15	005	twolined chestnut borers	Agrilus bilineatus		
15006	15	006	bronze poplar borer	Agrilus liragus		
15007	15	007	carpenter bees	Apidae		
15008	15	008	flatheaded borer	Buprestidae		
15009	15	009	golden buprestid	Buprestis aurulenta		
15010	15	010	carpenter ants	Camponotus spp.		
15011	15	011	gouty pitch midge	Cecidomyia piniinopis		
15012	15	012	shootboring sawflies	Cephidae		
15013	15	013	roundheaded borer	Cerambycidae		
15014	15	014	flatheaded apple tree borer	Chrysobothris femorata		
15015	15	015	cranberry girdler	Chrysoteuchia topiaria		
15016	15	016	Columbian timber beetle	Corthylus columbianus		
15017	15	017	pitted ambrosia beetle	Corthylus punctatissimus		
15018	15	018	carpenterworm moths	Cossidae		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
15019	15	019	poplar and willow borer	Cryptorphynchus lapathi		
15020	15	020	pine reproduction weevil	Cylindrocopturus eatoni		
15021	15	021	Douglas-fir twig weevil	Cylindrocopturus furnissi		
15022	15	022	Zimmerman pine moth	Dioryctria zimmermani		
15023	15	023	oak twig borers	Elaphidionoides spp.		
15024	15	024	twig pruner	Elaphidionoides villosus		
15025	15	025	lesser cornstalk borer	Elasmopalpus lignosellus		
15026	15	026	red oak borer	Enaphalodes rufulus	Damage to ≥10% of the bole circumference.	**SRS**
15027	15	027	ponderous borer	Ergates spiculatus		
15028	15	028	eastern pine shoot borer	Eucosma gloriola		
15029	15	029	western pine shoot borer	Eucosma sonomana		
15030	15	030	Eucosma shoot borers	Eucosma spp.		
15031	15	031	sugar maple borer	Glycobius speciosus		
15032	15	032	Goes borers	Goes spp.		
15033	15	033	pine root collar weevil	Hylobius radicis		
15034	15	034	Warren root collar weevil	Hylobius warreni		
15035	15	035	powderpost beetle	Lyctidae		
15036	15	036	tarnished plant bug	Lygus lineolaris		
15037	15	037	bark weevils	Magdalis spp.		
15038	15	038	white pine barkminer moth	Marmara fasciella		
15039	15	039	locust borer	Megacyllene robiniae		
15040	15	040	California flathead borer	Melanophila californica		
15041	15	041	flatheaded fir borer	Melanophila drummondi		
15042	15	042	whitespotted sawyer	Monochamus scutellatus		
15043	15	043	redheaded ash borer	Neoclytus acuminutus		
15044	15	044	western ash borer	Neoclytus conjunctus		
15045	15	045	oberea shoot borers	Oberea spp.		
15046	15	046	eucalyptus longhorned borer	Phoracantha semipunctata		
15047	15	047	northern pine weevil	Pissodes approximatus		
15048	15	048	balsam bark weevil	Pissodes dubius		
15049	15	049	Monterey pine weevil	Pissodes radiatae		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
15050	15	050	Engelmann spruce weevil	Pissodes strobi		
15051	15	051	lodgepole terminal weevil	Pissodes terminalis		
15052	15	052	ambrosia beetles	Platypus spp.	Damage to ≥10% of the bole circumference.	**SRS**
15053	15	053	cottonwood borer	Plectrodera scalator		
15054	15	054	balsam shootboring sawfly	Pleroneura brunneicornis		
15055	15	055	pine gall weevil	Podapion gallicola		
15056	15	056	ash borer	Podesesia syringae fraxini		
15057	15	057	lilac borer	Podosesia syringae		
15058	15	058	carpenterworm	Prionoxystus robiniae		
15059	15	059	maple shoot borers	Proterteras spp.		
15060	15	060	western subterranean termite	Reticulitermes hesperus		
15061	15	061	coconut trunk weevil	Rhabdoscelus asperipennis		
15062	15	062	New Guinea sugarcane weevil	Rhabdoscelus obscurus		
15063	15	063	European pine shoot moth	Rhyacionia buoliana		
15064	15	064	western pine tip moth	Rhyacionia bushnelli		
15065	15	065	Nantucket pine tip moth	Rhyacionia frustrana	Any damage to terminal leader; damage to ≥ 20% of lateral shoots and buds	
15066	15	066	lodgepole pine tip moth	Rhyacionia montana		
15067	15	067	southwestern pine tip moth	Rhyacionia neomexicana		
15068	15	068	poplar borer	Saperda calcarata		
15069	15	069	roundheaded appletree borer	Saperda candida		
15070	15	070	Saperda shoot borer	Saperda spp.		
15071	15	071	clearwing moths	Sesiidae		
15072	15	072	dogwood borer	Synanthedon scitula		
15073	15	073	roundheaded fir borer	Tetropium abietis		
15074	15	074	western larch borer	Tetropium velutinum		
15075	15	075	western cedar borer	Trachykele blondeli		
15076	15	076	Douglas-fir pitch moth	Vespamima novaroensis		
15077	15	077	sequoia pitch moth	Vespamima sequoia		
15078	15	078	black twig borer	Xylosandrus compactus		
15079	15	079	Pacific dampwood termite	Zootermopsis angusticollis		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
15080	15	080	subtropical pine tip moth	Rhyacionia subtropica		
15081	15	081	Asian ambrosia beetle	Xylosandrus crassiusculus		
15082	15	082	Asian longhorned beetle	Anoplophora glabripennis	Any occurrence	**SRS**
15083	15	083	cottonwood twig borer	Gypsonoma haimbachiana		
15084	15	084	southern pine sawyer	Monochamus titillator		
15085	15	085	banded ash borer	Neoclytus capraea		
15086	15	086	sitka spruce weevil	Pissodes sitchensis		
15087	15	087	emerald ash borer	Agrilus planipennis	Any occurrence	**NRS; SRS**
15088	15	088	hemlock borer	Melanophila fulvoguttata		
15089	15	089	Formosan subterranean termite	Coptotermes formosanus		
15090	15	090	sirex woodwasp	Sirex noctilio		
15091	15	091	Oregon fir sawyer	Monochamus scutellatus oregonensis		
15092	15	092	cypress weevil	Eudociminus mannerheimii		
15093	15	093	camphor shot borer	Xylosandrus mutilatus		
15094	15	094	goldenspotted oak borer	Agrilus coxalis		
15095	15	095	European oak borer	Agrilus sulcicollis		
15096	15	096	X. germanus ambrosia beetle	Xylosandrus germanus		
15097	15	097	*Icosium tomentosum*	Icosium tomentosum		
15800	15	800	other boring insect (known)	other boring insect (known)		
15900	15	900	unknown boring insect	unknown boring insect		
16000	**16**	**000**	**Seed/Cone/Flower/Fruit Insects**			
16001	16	001	Douglas-fir cone moth	Barbara colfaxiana		
16002	16	002	lodgepole cone beetle	Conophthorus contortae		
16003	16	003	limber pine cone beetle	Conophthorus flexilis		
16004	16	004	mountain pine cone beetle	Conophthorus monticolae		
16005	16	005	ponderosa pine cone beetle	Conophthorus ponderosae		
16006	16	006	Monterey pine cone beetle	Conophthorus radiatae		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
16007	16	007	red pine cone beetle	Conophthorus resinosae		
16008	16	008	white pine cone beetle	Conopthorus coniperda		
16009	16	009	black walnut curculio	Conotrachelus retentus		
16010	16	010	Douglas-fir cone gall midge	Contarinia oregonensis		
16011	16	011	Douglas-fir cone scale midge	Contarinia washingtonensis		
16012	16	012	acorn/nut weevils	Curculio spp.		
16013	16	013	Caroline fruitfly	Dacus frauenfeldi		
16014	16	014	spruce bud midge	Dasineura swainei		
16015	16	015	fir coneworm	Dioryctria abietivorella		
16016	16	016	southern pine cone worm	Dioryctria amatella		
16017	16	017	ponderosa pine coneworm	Dioryctria auranticella		
16018	16	018	loblolly pine cone worm	Dioryctria merkeli		
16019	16	019	ponderosa twig moth	Dioryctria ponderosae		
16020	16	020	Dioryctria pseudotsugella	Dioryctria pseudotsugella		
16021	16	021	Dioryctria moths	Dioryctria spp.		
16022	16	022	lodgepole cone moth	Eucosma rescissoriana		
16023	16	023	seed chalcid	Eurytomidae		
16024	16	024	slash pine flower thrips	Gnophothrips fuscus		
16025	16	025	spruce cone maggot	Hylemya anthracina		
16026	16	026	longleaf pine seed worm or moth	Laspeyresia ingens		
16027	16	027	ponderosa pine seed moth	Laspeyresia piperana		
16028	16	028	spruce seed moth	Laspeyresia youngana		
16029	16	029	boxelder bug	Leptocoris trivittatus		
16030	16	030	leaffooted pine seed bug	Leptoglossus corculus		
16031	16	031	western conifer seed bug	Leptoglossus occidentalis		
16032	16	032	hollyhock thrips	Liothrips varicornis		
16033	16	033	Magastigmus lasiocarpae	Magastigmus lasiocarpae		
16034	16	034	spruce seed chalcid	Magastigmus piceae		
16035	16	035	ponderosa pine seed chalcid	Megastigmus albifrons		
16036	16	036	fir seed chalcid	Megastigmus pinus		
16037	16	037	Douglas-fir seed chalcid	Megastigmus spermotrophs		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
16038	16	038	yellow poplar weevil	Odontopus calceatus		
16039	16	039	fruitpiercing moth	Othreis fullonia		
16040	16	040	roundheaded cone borer	Paratimia conicola		
16041	16	041	mango shoot caterpillar	Penicillaria jocosatrix		
16042	16	042	coneworm	Phycitidae		
16043	16	043	harvester ants	Pogonomyrmex spp.		
16044	16	044	citrus flower moth	Prays citri		
16045	16	045	fir cone maggot	Strobilomyia abietis		
16046	16	046	spruce cone maggot	Strobilomyia anthracina		
16047	16	047	shieldbacked pine seed bug	Tetyra bipunctata		
16048	16	048	coneworm	Hylemia spp.		
16049	16	049	prairie tent caterpillar	Malacosoma lutescens		
16050	16	050	jack pine tip beetle	Conophthorus banksianae		
16051	16	051	webbing coneworm	Dioryctria disclusa		
16052	16	052	blister coneworm	Dioryctria clarioralis		
16053	16	053	southern cone gall midge	Cecidomyia bisetosa		
16054	16	054	seed bugs	Lygaeidae spp.		
16800	16	800	other seed/cone/flower insect (known)	other seed/cone/flower insect (known)		
16900	16	900	unknown seed/cone/ flower insects	unknown seed/cone/ flower insects		
17000	**17**	**000**	**Gallmaker Insects**			
17001	17	001	birch budgall mite	Aceria rudis		
17002	17	002	eastern spruce gall adelgid	Adelges abietis		
17003	17	003	Cooley spruce gall adelgid	Adelges cooleyi		
17004	17	004	horned oak gall	Callirhytis cornigera		
17005	17	005	oak gall wasp	Callirhytis quercuspunctata		
17006	17	006	gall midge	Cecidomyiidae		
17007	17	007	Douglas-fir needle gall midge	Contarinia pseudotsugae		
17008	17	008	gall mite	Eriophyidae		
17009	17	009	spruce gall midge	Mayetiola piceae		
17010	17	010	hackberry nipplegall maker	Pachypsylla celtidismamma		
17011	17	011	balsam gall midge	Paradiplosis tumifex		
17012	17	012	hickory gall Phylloxera	Phylloxera caryaecaulis		
17013	17	013	gall aphid	Phylloxeridae		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
17014	17	014	alder gall mite	Phytoptus laevis		
17015	17	015	psyllid	Psyllidae		
17016	17	016	sugarberry psyllid	Tetragonocephela flava		
17017	17	017	mountain apple psyllid	Trioza vitiensis		
17018	17	018	gouty pitch midge	Cedidomyia piniinopsis		
17019	17	019	spider mites	Oligonychus spp.		
17020	17	020	cypress gall midges	Taxodiomyia spp.		
17021	17	021	jumping oak gall wasp	Neuroterus saltatorius		
17022	17	022	erythrina gall wasp	Quadrastichus erythrinae		
17800	17	800	other gallmaking insect (known)	other gallmaking insect (known)		
17900	17	900	unknown gallmaking insect	unknown gallmaking insect		
18000	**18**	**000**	**Insect Predators**			
18001	18	001	lacewing			
18002	18	002	blackbellied clerid	Enoclerus lecontei		
18003	18	003	redbellied clerid	Enoclerus sphegeus		
18004	18	004	red wood ant	Formica rufa		
18005	18	005	western yellowjacket	Vespula pennsylvanica		
19000	**19**	**000**	**General Diseases**		Any damage to the terminal leader; damage $\geq$ 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 $\geq$ 20% of the foliage with $\geq$ 50% of the leaf/needle affected	**ALL**
20000	**20**	**000**	**Biotic Damage**			
20001	20	001	damping off			
20002	20	002	gray mold	Botrytis cinerea		
20003	20	003	Cassytha	Cassytha filiformis		
20004	20	004	hemlock fluting			
21000	**21**	**000**	**Root/Butt Diseases**		Any occurrence	**ALL**
21001	21	001	Armillaria root disease	Armillaria spp.	Any occurrence	**PNW; NRS; SRS**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
21002	21	002	yellow stringy rot	Corticium galactimum		
21003	21	003	Cylindrocladium root disease	Cylindrocladium spp.		
21004	21	004	brown crumbly rot	Fomitopsis pinicola		
21005	21	005	black root rot of pine	Fusarium oxysporum		
21006	21	006	Fusarium root rot	Fusarium spp.		
21007	21	007	white mottled rot	Ganoderma applanatum		
21008	21	008	Ganoderma rot of hardwoods	Ganoderma lucidum		
21009	21	009	Ganoderma rot of conifers	Ganoderma tsugae		
21010	21	010	Heterobasidion root disease	Heterobasidion annosum	Any occurrence	**PNW; NRS; SRS**
21011	21	011	circinatus root rot	Inonotus circinatus		
21012	21	012	tomentosus root rot/false velvet top fungus	Inonotus tomentosus		
21013	21	013	charcoal root rot	Macrophomina phaseolina		
21014	21	014	black stain root disease	Ophiostoma wageneri	Any occurrence	**PNW**
21015	21	015	Schweinitzii root and butt rot	Phaeolus schweinitzii	Any occurrence	**PNW**
21016	21	016	flame tree root disease	Phellinus noxious		
21017	21	017	laminated root rot	Phellinus weirii	Any occurrence	**PNW**
21019	21	019	littleleaf disease/ Phytophthora root rot	Phytophthora cinnamomi	Any occurrence	**SRS**
21020	21	020	Port-Orford-Cedar root disease	Phytophthora lateralis	Any occurrence	**PNW**
21022	21	022	Pythium root rot	Pythium spp.		
21023	21	023	procera root disease of conifers	Verticicladiella procera		
21024	21	024	crown gall	Agrobacterium tumefaciens		
21025	21	025	borealis conk	Climacocystis borealis		
21026	21	026	yellow pitted rot	Hericium abietis		
21027	21	027	brown cubical rot	Laetiporus sulphureus	Any occurrence	**PNW**
21028	21	028	sudden oak death	Phytophthora ramorum	Any occurrence	**PNW; SRS**
21029	21	029	Rhizina root disease	Rhizina undulata		
21030	21	030	yellow root rot	Perenniporia subacida		
21031	21	031	brown top rot	Fomitopsis cajanderi		
21033	21	033	pocket dry rot	Tyromyces amarus		
21700	21	700	root or butt decay (indicators present)	root or butt decay (indicators present)		
21800	21	800	other root or butt disease (known)	other root or butt disease (known)		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
21900	21	900	unknown root or butt disease	unknown root or butt disease		
22000	**22**	**000**	**Cankers**		Any occurrence	**All**
22005	22	005	viruses			
22006	22	006	black knot of cherry	Apiosporina morbosa	Any occurrence on the bole or on branches ≤1 foot from bole; damage to ≥50% of branches	**NRS; SRS**
22007	22	007	Atropellis canker	Atropellis piniphila		
22008	22	008	Siberian elm canker	Botryodiplodia hypodermia		
22009	22	009	Botryosphaeria canker	Botryosphaeria ribis		
22011	22	011	Caliciopsis canker	Caliciopsis pinea		
22012	22	012	black canker of aspen	Ceratocystis fimbriata		
22013	22	013	sycamore canker stain	Ceratocystis fimbriata f.sp. plataini		
22023	22	023	chestnut blight	Cryphonectria parasitica	Any occurrence	**NRS**
22025	22	025	Cryptosphaeria canker of aspen	Cryptosphaeria populina		
22026	22	026	Cytospora canker of fir	Cytospora abietis		
22029	22	029	sooty-bark canker	Encoelia pruinosa		
22030	22	030	Eutypella canker	Eutypella parasitica	Any occurrence	**NRS**
22032	22	032	pitch canker of pines	Fusarium subglutinans	Any occurrence	**PNW**
22033	22	033	Fusicoccum canker	Fusicoccum spp.		
22034	22	034	Scleroderris canker	Gremmeniella abietina		
22035	22	035	amelanchier rust	Gymnosporangium harknessianum		
22036	22	036	cedar apple rust	Gymnosporangium juniperi-virginianae		
22037	22	037	Hypoxylon canker of oak	Hypoxylon atropunctatum	Any occurrence	**SRS**
22038	22	038	Hypoxylon canker of aspen	Hypoxylon mammatum	Any occurrence	**NRS**
22041	22	041	European larch canker	Lachnellula willkommii		
22042	22	042	beech bark disease	Nectria coccinea	Any occurrence	**NRS; SRS**
22043	22	043	Nectria canker	Nectria galligena	Any occurrence	**NRS**
22050	22	050	Phomopsis canker	Phomopsis occulta		
22051	22	051	Phomopsis canker	Phomopsis spp.		
22052	22	052	cypress canker	Seiridium cardinale		
22053	22	053	butternut canker	Sirococcus clavigignenti-jugl.	Any occurrence	**NRS**
22054	22	054	maple canker	Steganosporium spp.		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
22055	22	055	Thyronectria canker	Thyronectria austro-americana		
22056	22	056	citrus canker	Xanthomonas citri		
22057	22	057	Cytospora canker of aspen	Cytospora chrysosperma		
22058	22	058	Dothichiza canker	Dothichiza populae		
22060	22	060	Leucocytospora canker of spruce	Leucocytospora kunzei		
22073	22	073	hemlock canker	Xenomeris abietis		
22075	22	075	Lachnellula canker	Lachnellula flavovirens		
22076	22	076	strumella canker	Strumella coryneoidea		
22077	22	077	phomopsis blight	Phomopsis juniperovora		
22078	22	078	fusarium canker of yellow poplar	Fusarium solani		
22079	22	079	sterile conk of maple and beech	Inonotus glomeratus		
22080	22	080	canker of spruce	Aleurodiscus spp.		
22082	22	082	Discocainia canker	Discocainia treleasei		
22083	22	083	red ring rot canker	Phellinus pini var. cancriformans		
22084	22	084	Douglas-fir cankers	Douglas-fir cankers		
22085	22	085	Scleroderris canker of western firs	Grovesiella abieticola		
22086	22	086	Thousand cankers disease	Geosmithia morbida	Any occurrence	**SRS**
22087	22	087	nonrust canker	unknown	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)		
22400	22	400	unknown canker disease	unknown canker disease		
22500	**22**	**500**	**Stem Decay**		Any visual evidence (conks; fruiting bodies; rotten wood)	**All**
22001	22	001	heart rot		Any visual evidence	**SRS**
22002	22	002	stem rot		Any visual evidence	
22003	22	003	sap rot		Any visual evidence	
22004	22	004	slime flux			
22010	22	010	black rot fungus	Botryosphaeria stevensii		
22024	22	024	gray-brown sap rot	Cryptoporus volvatus		
22027	22	027	western red rot	Dichomitus squalens		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
22028	22	028	Indian paint fungus	Echinodontium tinctorium	Any occurrence	**PNW**
22031	22	031	Fusarium cortical stem rot	Fusarium avenaceum		
22039	22	039	canker rot of oak	Inonotus hispidus		
22040	22	040	sterile conk trunk rot of birch	Inonotus obliquus		
22044	22	044	ash heart rot	Pereniporia fraxinophila		
22047	22	047	red heart rot	Phellinus pini	Any occurrence	**PNW**
22048	22	048	aspen trunk rot	Phellinus tremulae		
22049	22	049	stem decay of black walnut	Phellinus weirianus		
22059	22	059	red belt fungus/brown crumbly rot	Fomitopsis pinicola		
22062	22	062	quinine fungus/brown trunk rot	Fomitopsis Officinalis		
2263	22	063	brown cubical decay	Coniophora puteana		
22064	22	064	tinder fungus	Fomes fomentarius		
22065	22	065	purple conk	Hirschioporus abietinus		
22066	22	066	pinyon black stain	Leptographium wagnerii		
22067	22	067	Phellinus hartigii	Phellinus hartigii		
22068	22	068	false tinder fungus	Phellinus igniarius		
22069	22	069	robustus conk	Phellinus robustus		
22070	22	070	yellow cap fungus	Pholiota spp.		
22071	22	071	oyster mushroom	Pleurotus ostreatus		
22072	22	072	white ring rot	Poria albipellucida		
22074	22	074	cedar brown pocket rot	Poria sericeomollis		
22081	22	081	birch conk	Piptoporus betulinus		
22800	22	800	other stem decay (known)	other stem decay (known)		
22900	22	900	unknown stem decay	unknown stem decay		
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		
23002	23	002	parasitic plants	parasitic plants		
23003	23	003	vine damage	vine damage	Vines covering ≥50% of crown	**PNW; NRS**
23005	23	005	white fir dwarf mistletoe	Arceuthobium abietinum f. sp. concoloris		
23006	23	006	lodgepole pine dwarf mistletoe	Arceuthobium americanum		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
23007	23	007	Apache dwarf mistletoe	Arceuthobium apachecum		
23008	23	008	western dwarf mistletoe	Arceuthobium campylopodum		
23009	23	009	limber pine dwarf mistletoe	Arceuthobium cyanocarpum		
23010	23	010	pinyon dwarf mistletoe	Arceuthobium divaricatum		
23011	23	011	Douglas-fir dwarf mistletoe	Arceuthobium douglasii	Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes or vines covering ≥ 50% of crown	**SRS**
23012	23	012	Chihuahua pine dwarf mistletoe	Arceuthobium gillii		
23013	23	013	larch dwarf mistletoe	Arceuthobium laricis		
23014	23	014	western spruce dwarf mistletoe	Arceuthobium microcarpum		
23015	23	015	eastern dwarf mistletoe	Arceuthobium pusillum	Any occurrence	**NRS**
23016	23	016	hemlock dwarf mistletoe	Arceuthobium tsugense		
23017	23	017	southwestern dwarf mistletoe	Arceuthobium vaginatum subsp. crytopodum	Dwarf mistletoes with Hawksworth rating of ≥3; true mistletoes or vines covering ≥ 50% of crown	**SRS**
23018	23	018	dodder	Cuscuta spp.		
23019	23	019	white fir mistletoe	Phoradendron bolleanum subsp. pauciflorum		
23020	23	020	true mistletoe (other)		True mistletoe covering ≥50% of crown	**IW; PNW**
23021	23	021	red fir dwarf mistletoe	Arceuthobium abietinum f. sp. magnificae		
23022	23	022	juniper true mistletoe	Phoradendron juniperum		
23023	23	023	dwarf mistletoe	Arceuthobium spp.	Hawksworth rating of ≥3	**IW; PNW**
23024	23	024	Weins dwarf mistletoe	Arceuthobium abietinum f. sp magnificae		
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		
24002	24	002	Norfolk Island pine decline	Norfolk Island pine decline		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
24003	24	003	Stillwell's syndrome	Stillwell's syndrome		
24004	24	004	ash decline/yellows	ash decline/yellows	Damage ≥ 20% dieback of crown area	**NRS**
24005	24	005	birch dieback	birch dieback		
24006	24	006	coconut cadang-cadang viroid	Cocadviroid coconut cadang-cadang viroid		
24007	24	007	complex	complex		
24008	24	008	decline	decline		
24009	24	009	fall hardwood defoliator complex	fall hardwood defoliator complex		
24010	24	010	joga decline	joga decline		
24011	24	011	larch decline	larch decline		
24012	24	012	looper abiotic complex	looper abiotic complex		
24013	24	013	maple decline	maple decline		
24014	24	014	oak decline	Hypoxylon spp.	Damage ≥ 20% dieback of crown area	**SRS**
24015	24	015	pingelap disease	pingelap disease		
24016	24	016	sprout dieback	sprout dieback		
24017	24	017	true fir pest complex	true fir pest complex		
24018	24	018	western X disease	western X disease		
24019	24	019	pinewood nematode	Bursaphelenchus xylophilus		
24020	24	020	sapstreak disease of sugar maple	Ceratocystis coerulescens		
24021	24	021	oak wilt	Ceratocystis fagacearum	Damage ≥ 20% dieback of crown area	**NRS**
24022	24	022	Dutch elm disease	Ceratocystis ulmi	Damage ≥ 20% dieback of crown area	**NRS; SRS**
24023	24	023	bacterial wetwood	Erwinia nimipressuralis		
24024	24	024	mimosa wilt	Fusarium oxysporum f. sp. perniciosum		
24025	24	025	Verticillium wilt	Verticilium albo-atrum		
24026	24	026	bacterial leaf scorch	Xylella fastidiosa		
24027	24	027	wetwood	wetwood		
24028	24	028	hemlock decline	hemlock decline		
24029	24	029	Pacific madrone decline	Pacific madrone decline		
24030	24	030	elm phloem necrosis	Mycoplasma spp.		
24031	24	031	laurel wilt	Raffaelea spp.	Damage ≥ 20% dieback of crown area	**SRS**
24032	24	032	sudden aspen decline	sudden aspen decline		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
24800	24	800	other decline/complex/wilt (known)	other decline/complex/ wilt (known)		
24900	24	900	unknown decline/complex/ wilt	unknown decline/complex/ wilt		
25000	**25**	**000**	**Foliage diseases**		Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
25001	25	001	blight	blight		
25003	25	003	juniper blights	juniper blights		
25004	25	004	leaf spots	leaf spots		
25005	25	005	needlecast	needlecast		
25006	25	006	powdery mildew	powdery mildew		
25007	25	007	tobacco mosaic virus	tobacco mosaic virus		
25008	25	008	tobacco ringspot virus of ash	Nepovirus TRSV		
25009	25	009	true fir needlecast	true fir needlecast		
25010	25	010	sycamore anthracnose	Apiognomonia veneta	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
25011	25	011	Cercospora blight of juniper	Cercospora sequoiae		
25013	25	013	large-spored spruce-laborador tea rust	Chrysomyxa ledicola		
25014	25	014	ink spot of aspen	Ciborinia whetzelii		
25015	25	015	pine needle rust	Coleosporium spp.	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
25016	25	016	anthracnose on Russian olive	Colletotrichum spp.		
25017	25	017	Coronado limb rust	Cronartium arizonicum		
25018	25	018	leaf shothole	Cylindrosporium spp.		
25019	25	019	cedar leaf blight	Didymascella thujina		
25020	25	020	dogwood anthracnose	Discula spp.	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
25021	25	021	mango scab	Elsinoe magiferae		
25022	25	022	Elytroderma needle blight	Elytroderma deformans		
25023	25	023	fire blight	Erwinia amylovora		
25024	25	024	walnut anthracnose	Gnomonia leptostyla	Damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
25025	25	025	anthracnose	Gnomonia spp.		
25027	25	027	brown felt blight	Herpotrichia juniperi		
25028	25	028	larch needle blight	Hypodermella laricis		
25029	25	029	hardwood anthracnose	Kabatiella apocrypta		
25030	25	030	Lasiodiplodia cone damage	Lasiodiplodia spp.		
25031	25	031	spruce needle cast	Lirula macrospora		
25032	25	032	fir needle cast	Lirula spp.		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
25033	25	033	white pine needle cast	Lophodermella arcuata		
25034	25	034	Lophodermella needle cast	Lophodermella spp.		
25036	25	036	Marssonina blight	Marssonina populi		
25037	25	037	Douglas-fir rust	Melampsora medusae		
25039	25	039	larch needle cast	Meria laricis		
25040	25	040	Dothistroma needle blight	Mycosphaerella pini		
25041	25	041	brown felt blight of pines	Neopeckia coulteri		
25042	25	042	snow blight	Phacidum abietis		
25043	25	043	Swiss needle cast	Phaeocryptopus gaumannii		
25044	25	044	Phoma blight	Phoma spp.		
25045	25	045	Phyllosticta leaf spot	Phyllosticta spp.		
25046	25	046	bud rot	Phytophthora palmivora		
25047	25	047	Ploioderma needle cast	Ploioderma spp.		
25048	25	048	ash rust	Puccinia sparganioides		
25049	25	049	fir and hemlock needle rusts	Pucciniastrum spp.		
25050	25	050	Rhabdocline needle cast	Rhabdocline spp.		
25051	25	051	Rhizoctonia needle blight	Rhizoctonia spp.		
25052	25	052	Rhizophaeria needle cast	Rhizophaeria spp.		
25053	25	053	Rhizopus rot	Rhizopus artocarpi		
25054	25	054	brown spot needle blight	Scirrhia acicola		
25055	25	055	Septoria leaf spot	Septoria alnifolia		
25056	25	056	Septoria leaf spot and canker	Septoria musiva		
25057	25	057	Sirococcus tip blight	Sirococcus conigenus		
25058	25	058	Diplodia canker	Sphaeropsis sapinea		
25059	25	059	leaf blister of oak	Taphrina caerulescens		
25060	25	060	Venturia leaf blight of maple	Venturia acerina		
25061	25	061	shepherd's crook	Venturia tremulae		
25062	25	062	Dothistroma needle blight	Dothistroma septospora		
25063	25	063	yellow-cedar shoot blight	Apostrasseria spp.		
25065	25	065	spruce needle rust	Chrysomyxa weirii		
25066	25	066	cedar leaf blight	Gymnosporangium nootkatense		
25067	25	067	spruce needle cast	Lophodermium picea		
25068	25	068	hardwood leaf rusts	Melampsora spp.		
25070	25	070	hemlock needle rust	Pucciniastrum vaccinii		
25071	25	071	spruce needle cast	Rhizosphaera pini		
25072	25	072	sirococcus shoot blight	Sirococcus strobilinus		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
25073	25	073	shepherds crook	Venturia populina		
25074	25	074	Delphinella shoot blight	Delphinella abietis		
25075	25	075	tar spot	Rhytisma acerinum		
25076	25	076	birch leaf fungus	Septoria betulae		
25077	25	077	Septoria leaf spot of maple	Septoria aceris		
25800	25	800	other /shoot disease (known)	other /shoot disease (known)		
25900	25	900	unknown foliage /shoot disease	Unknown foliage /shoot disease		
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	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		
26003	26	003	stalactiform blister rust	Cronartium coleosporioides		
26004	26	004	comandra blister rust	Cronartium comandrae	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	**SRS**
26005	26	005	pinyon rust	Cronartium occidentale		
26006	26	006	eastern gall rust	Cronartium quercuum	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems; damage to ≥ 20% of branches	**SRS**
26007	26	007	gall rust of jack pine	Cronartium quercuum f. sp. banksignae		
26008	26	008	gall rust of shortleaf pine	Cronartium quercuum f. sp. echinatae		
26009	26	009	fusiform rust	Cronartium quercuum f. sp. fusiforme	Any occurrence on the bole or stems (on multi-stemmed woodland species), or on branches ≤1 foot from boles or stems;	**SRS**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
					damage to ≥ 20% of branches.	
26010	26	010	gall rust of virginia pine	Cronartium quercuum f. sp. virginianae		
26011	26	011	Bethuli rust	Peridermium bethuli		
26012	26	012	limb rust	Peridermium filamentosum		
26013	26	013	southern cone rust	Cronartium strobilinum		
26800	26	800	other stem rust (known)	other stem rust (known)		
26900	26	900	unknown stem rust	unknown stem rust		
27000	**27**	**000**	**Broom Rusts**		≥50% of crown area affected	**ALL**
27001	27	001	spruce broom rust	Chrysomyxa arctostaphyli		
27002	27	002	Incense cedar broom rust	Gymnosporangium libocedri		
27003	27	003	juniper broom rust	Gymnosporangium nidus-avis		
27004	27	004	fir broom rust	Melampsorella caryophyllacearum		
27800	27	800	other broom rust (known)	other broom rust (known)		
27900	27	900	unknown broom rust	unknown broom rust		
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			
30002	30	002	human caused fire			
30003	30	003	crown fire damage			
30004	30	004	ground fire damage			
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.		

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
41002	41	002	beavers	Castor canadensis	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**SRS**
41003	41	003	big game	big game	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**IW**
41004	41	004	mice or voles	mice or voles		
41005	41	005	pocket gophers	Geomyidae spp.	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**IW**
41006	41	006	porcupines	Erethizon dorsatum	Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥ 20% of the foliage with ≥ 50% of the leaf/needle affected	**IW**
41007	41	007	rabbits or hares	Sylvilagus spp.		
41008	41	008	sapsuckers	Sphyrapicus spp.		**IW; SRS**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
41009	41	009	squirrels	Sciuridae spp.		
41010	41	010	woodpeckers	Piciformes spp.		
41011	41	011	moose	Alces alces		
41012	41	012	elk	Cervus elaphus		
41013	41	013	deer	Odocoileus spp.		
41014	41	014	feral pigs	Sus scrofa		
41015	41	015	mountain beaver	Aplodontia rufa		
41017	41	017	earthworms	Lumbricidae		
41800	41	800	other wild animals (known)	other wild animals (known)		
41900	41	900	unknown wild animals	unknown wild animals		
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		
42002	42	002	goats	Capra hircus		
42003	42	003	horses	Equus caballus		
42004	42	004	sheep	Ovis aries		
42800	42	800	other domestic animal (unknown)	other domestic animal (unknown)		
42900	42	900	unknown domestic animals	unknown 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**
50001	50	001	air pollutants		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the	**IW**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
					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	
50002	50	002	chemical		Any damage to the terminal leader; damage ≥20% of the roots, stems, or branches; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**NRS**
50003	50	003	drought		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW; NRS**
50004	50	004	flooding/high water		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW; NRS; SRS**
50005	50	005	frost		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50006	50	006	hail			
50007	50	007	heat			

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
50008	50	008	lightning		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
50009	50	009	nutrient imbalances			
50010	50	010	radiation		Any damage to the terminal leader; damage ≥20% of the roots or boles with >20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with >20% of the circumference affected; >20% of the branches affected; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50011	50	011	snow/ice		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
50013	50	013	wind		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥ 20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
50014	50	014	winter injury		Any damage to the terminal leader; damage ≥20% of the roots or boles	**IW**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
					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	
50015	50	015	avalanche		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**IW**
50016	50	016	mud-land slide			
50017	50	017	volcano			
50018	50	018	other geologic event			
50019	50	019	mechanical (non-human caused)			
50020	50	020	saltwater injury - flooding/hurricane			
50800	50	800	other abiotic damage (known)	other abiotic damage (known)		
50900	50	900	unknown abiotic damage	unknown 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		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	**ALL**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
					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	
70001	70	001	herbicides		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
70003	70	003	imbedded objects		Any occurrence on the bole.	**SRS; NRS**
70004	70	004	improper planting technique			
70005	70	005	land clearing		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage > 20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**SRS**
70006	70	006	land use conversion			
70007	70	007	logging damage		Any damage to the terminal leader; damage ≥20% of the roots or boles with > 20% of the circumference affected; damage >20% of the multiple-stems (on multi-stemmed woodland species) with > 20% of the circumference affected; >20% of the branches affected ; damage ≥20% of the foliage with ≥50% of the leaf/needle affected	**ALL**
70008	70	008	mechanical			
70009	70	009	pesticides			
70010	70	010	roads			

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
70011	70	011	soil compaction			
70013	70	013	vehicle damage			
70014	70	014	road salt			
71000	**71**	**000**	**Harvest**		Removal of ≥10% cubic volume	**ALL**
71001	71	001	Woodland cutting		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)			
80002	80	002	subalpine fir mortality			
80003	80	003	five-needle pine decline			
80004	80	004	pinyon pine mortality			
85000	**85**	**000**	**Invasive Plants**			
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	When actual length is less than total length	**ALL**
90002	90	002	dead top		Any occurrence	**IW; PNW; NRS**
90003	90	003	limby-wolf tree	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	**IW**
90004	90	004	forked top	Not recorded for non sawlog trees	Any occurrence	**PNW**
90005	90	005	forked below merch top	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	**IW; PNW**
90006	90	006	crook or sweep	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	**IW; PNW**
90007	90	007	checks, bole cracks	Not recorded for non sawlog trees	Damage when board foot defect is ≥ 10%	**PNW**
90008	90	008	foliage discoloration		Damage ≥ 20% of crown affected	**IW; NRS;PNW**
90010	90	010	dieback		Damage ≥ 20% of crown affected	**ALL**
90011	90	011	open wound		Damage ≥20% of bole	**IW; PNW**

CODE	Category	Agent	Common Name	Scientific Name	Threshold	REGION
					circumference (in a running 3-foot section) at point of occurrence	
90012	90	012	resinosis		Damage ≥20% of bole circumference (in a running 3-foot section) at point of origin; ≥20% of branches affected	**PNW**
90013	90	013	broken branches		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 K. Damage Agent codes for PNW

Damage Agent is a 2-digit code with values 01 to 91. For Agent and Severity 1, 2 and 3: the agent and severity codes indicate the type of agents that were present on a tree and describe their severity. Several damaging agents are automatically of highest importance and should be coded before any other agents; these agents are grouped as Class I Agents. Class I insects, diseases, or physical injuries can seriously affect vegetation. Failure to account for these agents can result in large differences in predicted outcomes for tree growth, survival, vegetative composition and structure. Class II agents can be important in local situations; recording their incidence and severity provides valuable information for those situations. Class II agents are recorded when present but only after all Class I agents.

Agents and their severity ratings are grouped by broad category. Each category has a general agent and specific agents listed. The general codes should be used if there is any question as to the identity of the specific damaging agent.

Class I Agents

	Agents		Severity	
	Code	**Agent**	**Code**	**Severity**
Bark beetles:				
	01	General /other bark beetle	1	Unsuccessful current attack
	02	Mountain pine beetle	2	Successful current attack
	03	Douglas-fir beetle	3	Last year's successful attack
	04	Spruce beetle	4	Older dead
	05	Western pine beetle	5	Top kill
	06	Pine engraver beetle		
	07	Fir engraver beetle		
	08	Silver fir beetle		
	09	Red turpentine beetle		
	26	Jeffrey pine beetle		
	Code	**Agent**	**Code**	**Severity**
Defoliators:			0	No detectable defoliation
	10	General/other	1	Up to 33% of foliage (old and new missing/affected)
	11	Western blackheaded budworm	2	34 to 66% of foliage missing/affected
	12	Pine butterfly	3	67 to 100% of foliage missing/affected
	13	Douglas-fir tussock moth		
	14	Larch casebearer		
	15	Western spruce or Modoc budworm		
	16	Western hemlock looper		
	17	Sawflies		
	18	Needles and sheath miners		
	19	Gypsy moth		

Class I Agents

Agents			Severity	
	Code	**Agent**	**Code**	**Severity**
Root diseases:				
	60	General/other	1	Tree is a live tally tree within 30 ft of a tree or stump that has a root disease to which the tally tree is susceptible
	61	Annosus root disease		
	62	Armillaria root disease		
	63	Black stain root disease	2	Live tally tree with signs or symptoms diagnostic for root disease such as characteristic decay, stain, ectotrophic mycelia, mycelial fans, conks or excessive resin flow at the root collar. No visible crown deterioration.
	65	Laminated root rot		
	66	Port-Orford-cedar root disease	3	Live tally tree with signs or symptoms diagnostic for root disease such as characteristic decay, stain, ectotrophic mycelia, mycelial fans, conks, or excessive resin flow at the root collar. Visible crown deterioration such as thinning chlorotic foliage, reduced terminal growth, and/or stress cones.
	Code	**Agent**	**Code**	**Severity**
White pine blister rust:				
	36	White pine blister rust	1	Branch infections located more than 2.0 feet from tree bole.
			2	Branch infections located 0.5 to 2.0 feet from bole.
			3	Bole infections present, Or: branch infections within 0.5 feet of bole
	Code	**Agent**	**Code**	**Severity**
Sudden oak death (tanoak, coast live oak, black oak):				
	31	Sudden oak death symptoms	1	Bleeding present on bole
			2	Bleeding present on bole and adjacent mortality present
			3	Laboratory confirmed sudden oak death

Class II Agents

Agents			Severity	
	Code	**Agent**	**Code**	**Severity**
Other insects:				
	20	General	1	Bottlebrush or shortened leaders, 0-2 forks on the tree's stem, Or: <20% of the branches affected, Or: <50% of the bole has visible larval galleries.
	21	Shoot moths		
	22	Weevils		
	23	Wood borers		
	24	Balsam wooly adelgid (aphid)	2	3 or more forks on the tree's bole, Or: 20% or more of the branches are affected, Or: the terminal leader is dead, Or: ≥50% of the bole has visible larval galleries.
	25	Sitka spruce terminal weevil		
	Code	**Agent**	**Code**	**Severity**
Stem-branch cankers:				
	33	Diplodia blight	1	Branch infections present. <50% of the crown affected
	40	General/other		
	41	Western gall rust (*Pinus ponderosa*, *Pinus contorta*)	2	Branch infections present. ≥50% of the crown affected, Or: any infection on the bole.
	42	Commandra blister rust (*Pinus ponderosa*)		
	43	Stalactiform rust (*Pinus contorta*)		
	44	Atropellis canker (*Pinus* spp.*)*		
	45	Cytospoa or Phomopsis (*Pseudotsuga menziesii, Abies* spp.)		
	Code	**Agent**	**Code**	**Severity**
Pitch canker:				
	32	Pitch canker (CA *Pinus* spp.)	1	No bole canker + <10 infected branch tips
			2	No bole canker + ≥10 infected branch tips
			3	1 or more bole cankers + <10 infected branch tips
			4	1 or more bole cankers + ≥10 infected branch tips
	Code	**Agent**	**Code**	**Severity**
Stem decays:	46	General/other	1	1 conk on the stem or present at ground level
	47	Red ring rot (*Phellinus pini*)		
	48	Indian paint rot (*Echinodontium tinctorium*)	2	2 or more conks separated by <16 feet on bole
	49	Brown cubical rot (*Phaeolus schweinitzii)*	3	2 or more conks separated by ≥16 feet on bole
			4	No conks. Visible decay in the interior of the bole

Class II Agents

Agents			Severity	
	Code	**Agent**	**Code**	**Severity**
Special agents:				
	50	Suppression	No severity rating	
	51	Excessively deformed sapling		
	Code	**Agent**	**Code**	**Severity**
Foliar pathogens:				
	55	General/other	1	<20% of foliage affected, or <20% of the crown contains brooms.
	56	Rhabdocline (only on *Pseudotsuga menziesii*)	2	≥20% of foliage affected, or ≥20% of the crown contains brooms.
	57	Elytroderma (only on *Pinus ponderosa*)		
	58	Broom rusts (only on *Abies, Picea, and Juniperus occidentalis*)		
	59	Swiss needle cast (only on *Pseudotsuga menziesii*)		
	Code	**Agent**	**Code**	**Severity**
Animal agents:				
	70	Animal; general/unknown	1	<20% of the crown is affected. Bole damage is restricted to less than half of circumference.
	71	Mountain beaver		
	72	Livestock		
	73	Deer or elk	2	≥20% of the crown is affected. Bole damage to half or more of circumference.
	74	Porcupines		
	75	Pocket gophers, squirrels, mice, voles, rabbits, hares		
	76	Beaver		
	77	Bear		
	78	Human (not logging)		
	Code	**Agent**	**Code**	**Severity**
Weather agents:				
	80	Weather; general/unknown	1	<20% of the crown is affected.
	81	Windthrow or wind breakage	2	≥20% of the crown is affected or any damage to the bole.
	82	Snow/ice bending or breakage		
	83	Frost damage on shoots		
	84	Winter desiccation		
	85	Drought/moisture deficiency		
	86	Sun scald		
	87	Lightning		

Class II Agents

Agents			Severity	
	Code	**Agent**	**Code**	**Severity**
Physical injury:	90	Other; general/unknown	1	<20% of the crown is affected.
	91	Logging damage	2	≥20% of the crown is affected or any damage to the bole.
	92	Fire; basal scars or scorch		
	93	Improper planting		
	94	Air pollution or other chemical damage		
	Code	**Agent**	**Code**	**Severity**
Physical defect:	95	Unspecified physical defect	0	Severity is not rated
	96	Broken/missing top		
	97	Dead top		
	98	Forks and crooks (only if caused by old top out or dead top)		
	99	Checks/bole cracks		

Appendix L. FIA Inventories by State, Year, and Type

State code	State name	Date(s) of available periodic inventory data	Initiation of annual inventory
1	Alabama	1972, 1982, 1990	2000
2	Alaska	1998, 2003	2004
4	Arizona	1985, 1999	2001
5	Arkansas	1978, 1988, 1995	2000
6	California	1994	2001
8	Colorado	1984	2002
9	Connecticut	1985, 1998	2003
10	Delaware	1986, 1999	2004
12	Florida	1970, 1980, 1987, 1995	2002
13	Georgia	1972, 1982, 1989	1997
15	Hawaii	-[1]	2010
16	Idaho	1991	2004
17	Illinois	1985, 1998	2001
18	Indiana	1986, 1998	1999
19	Iowa	1990	1999
20	Kansas	1981, 1994	2001
21	Kentucky	1988	2000
22	Louisiana	1974, 1984, 1991	2001
23	Maine	1995	1999
24	Maryland	1986, 1999	2004
25	Massachusetts	1985, 1998	2003
26	Michigan	1980, 1993	2000
27	Minnesota	1977, 1990	1999
28	Mississippi	1977, 1987, 1994	2006
29	Missouri	1989	1999
30	Montana	1989	2003
31	Nebraska	1983, 1994	2001
32	Nevada	1989	2004 [2]
33	New Hampshire	1983, 1997	2002
34	New Jersey	1987, 1999	2004
35	New Mexico	1987, 1999	2005[3]
36	New York	1993	2002
37	North Carolina	1984, 1990	2002
38	North Dakota	1980, 1995	2001
39	Ohio	1991	2001
40	Oklahoma	1989 (central/west), 1976, 1986, 1993 (east)	2008 (east) 2009 (west)
41	Oregon	1999	2001
42	Pennsylvania	1989	2000
44	Rhode Island	1985, 1998	2003
45	South Carolina	1968, 1978, 1986, 1993	1999
46	South Dakota	1980, 1995	2001
47	Tennessee	1980, 1989	1999
48	Texas	1975, 1986, 1992	2001 (east) 2004 (west)
49	Utah	1993	2000
50	Vermont	1983, 1997	2003
51	Virginia	1977, 1985, 1992	1998
53	Washington	1991, 2001	2002
54	West Virginia	1989, 2000	2004
55	Wisconsin	1983, 1996	2000

State code	State name	Date(s) of available periodic inventory data	Initiation of annual inventory
56	Wyoming	1984, 2000	2011
72	Puerto Rico	-[1]	2001
78	US Virgin Islands	-[1]	2004

[1] Periodic inventories were not conducted.
[2] Due to insufficient funding, annual inventory ceased after 2005. Sampling resumed in 2010 including plots that would have been measured in inventory years (INVYR) 2006-2009. Therefore, measurement year (MEASYR) is frequently different from INVYR.
[3]Annual inventory sampling began in 2008. Due to the State of New Mexico receiving The American Recovery and Reinvestment Act of 2009 (ARRA) money, sampling was accelerated beginning in 2010 and broadened to include plots that would have been surveyed had the inventory started in 2005. Therefore, measurement year (MEASYR) is frequently different from inventory year (INVYR).

Appendix M. Biomass Estimation in the FIADB

In versions prior to FIADB 4.0, a variety of regional methods were used to estimate tree biomass for live and dead trees in the TREE table. Starting in FIADB 4.0, a new nationally consistent method of estimating tree biomass was implemented. This new approach, called the component ratio method (CRM) (Heath and others 2009), involves calculating the dry weight of individual components before estimating the total aboveground or belowground biomass. The CRM approach is based on:

- converting the sound volume of wood (VOLCFSND) in the merchantable bole to biomass using a compiled set of wood specific gravities (Miles and Smith 2009) (see REF_SPECIES table for values)
- calculating the biomass of bark on the merchantable bole using a compiled set of percent bark estimates and bark specific gravities (Miles and Smith 2009) (see REF_SPECIES table for values)
- calculating the biomass of the entire tree (total aboveground biomass), merchantable bole (including bark), and belowground biomass, using equations from Jenkins and others (2003)
- calculating the volume of the stump (wood and bark) based on equations in Raile (1982) and converting this to biomass using the same specific gravities used for the bole wood and bark
- calculating the top biomass (tree tip and all branches) by subtracting all other biomass components from the total aboveground estimate
- calculating an adjustment factor by developing a ratio between bole biomass calculated from VOLCFSND to bole biomass using equations from Jenkins and others (2003)
- applying the adjustment factor to all tree components derived from both Jenkins and Raile

The CRM approach is based on assumptions that the definition of merchantable bole in the volume prediction equations is equivalent to the bole (stem wood) in Jenkins and others (2003), and that the component ratios accurately apply.

The tables in this appendix describe the equations used, beginning in FIADB 4.0 to estimate components of tree biomass, including stem wood (bole), top and branches combined, bark, stump, and coarse roots. Most of these components are estimated through a series of ratio equations as described by Jenkins and others (2003). Stem wood biomass is calculated directly from the sound cubic-foot volume of the tree bole, percentage of bark on the bole, and specific gravities of both wood and bark.

The individual component biomass values for bole, top, and stump are not available in FIADB for sapling-size timber tree species and all woodland tree species. Because saplings (trees from 1 to 4.9 inches in diameter) have no volume in FIADB, a ratio method was developed to compute a factor that is applied to saplings based on diameter and species, and the result is stored in DRYBIO_SAPLING. For woodland species (trees where diameter is measured at the root collar [DRC]), volume is calculated from the root collar to a 1½-inch top diameter. Because this volume accounts for a larger portion of the tree than timber species volume equations do, it was determined that the top and stump equations were not applicable to woodland species. Woodland tree volume is converted to biomass and stored in DRYBIO_WDLD_SPP, which is an estimate for total aboveground biomass, excluding foliage, the tree tip (top of the tree above 1½ inches in diameter), and a portion of the stump from ground to DRC. Therefore, only total aboveground and belowground biomass values are estimated for saplings and woodland species.

Definitions of each biomass component and the equations used to estimate the oven-dry weight in pounds are shown in appendix tables M-1 through M-4.

- Appendix table M-1 defines the columns that are stored in the TREE table, and clarifies the set of trees (species, dimensions, live or dead, etc.) that are used in each calculation.

- Appendix table M-2 defines the Jenkins component equations and explains how the equation results are used to estimate biomass. The 'Estimate name' in this table is the same name found in the coefficient definitions described in the biomass-related columns 38 to 49 of the REF_SPECIES table.

- Appendix table M-3 contains the Jenkins equations used to estimate each biomass component. The equations use the exact coefficient column names found in the REF_SPECIES table (for example, JENKINS_TOTAL_B1 in appendix table M-3 is the column name in REF_SPECIES that holds the value of the coefficient needed in the total aboveground biomass equation). The Jenkins equations use the measured tree diameter to produce an estimate.

- Appendix table M-4 contains the actual equations used in the FIADB to estimate the biomass components stored in the TREE table. These equations are a blend of Jenkins ratios, calculated bole biomass (based on calculated volume from the TREE table), and adjustment factors. The adjustment factor is an important step because it relates measurement-based bole biomass (DRYBIO_BOLE) to generalized equation-based bole biomass to improve or adjust the computed results of the Jenkins equations.

For more information please consult the publication by Heath and others (2009), titled *Investigation into Calculating Tree Biomass and Carbon in the FIADB Using a Biomass Expansion Factor Approach*.

Appendix table M-1. Definition of Biomass Components stored in the TREE table.

Component	**Column name**	**Biomass Component Definition (all are oven-dry biomass, pounds)**
Merchantable stem (bole)	DRYBIO_BOLE	Merchantable bole of the tree, includes stem wood and bark, from a 1-foot stump to a 4-inch top diameter. Based on VOLCFSND and specific gravity for the species. For timber species with a DIA ≥5 inches. Includes live and dead trees. (Note that VOLCFGRS or VOLCFNET might be used after adjustment based on national averages, if VOLCFSND is not available.)
Top	DRYBIO_TOP	Top of the tree above 4 inches diameter and all branches; includes wood and bark and excludes foliage. For live and dead timber species with a DIA ≥5 inches.
Stump	DRYBIO_STUMP	Stump of the tree, the portion of a tree bole from ground to 1 foot high, includes wood and bark. For live and dead timber species with a DIA ≥5 inches.
Belowground	DRYBIO_BG	Coarse roots of trees and saplings with a DIA ≥1 inch. For timber and woodland species, and live and dead trees.
Saplings	DRYBIO_SAPLING	Total aboveground portion of live trees, excluding foliage. For timber species with a DIA ≥1 inch and <5 inches.
Woodland tree species	DRYBIO_WDLD_SPP	Total aboveground portion of a tree, excluding foliage, the tree tip (top of the tree above 1½ inches in diameter) and a portion of the stump from ground to DRC. For live and dead woodland species with a DIA ≥1 inch. Woodland species are identified by REF_SPECIES.WOODLAND = X. Woodland species usually have TREE.DIAHTCD = 2 and TREE.WDLDSTEM >0

Appendix table M-2. Jenkins Biomass Component Equation Definitions (Refer to the REF_SPECIES table for equation coefficients and adjustment factors).

Component	Estimate name	Definition
Total aboveground biomass	total_AG_biomass_ Jenkins	Total biomass (oven-dry, pounds) of the aboveground portion of a tree. Includes stem wood, stump, bark, top, branches, and foliage.
Stem wood biomass ratio	stem_ratio	A ratio that estimates biomass of the merchantable bole of the tree by applying the ratio to total_AG_biomass_Jenkins. Includes wood only. This is the portion of the tree from a 1-foot stump to a 4-inch top diameter.
Stem bark biomass ratio	bark_ratio	A ratio that estimates biomass of the bark on the merchantable bole of the tree by applying the ratio to total_AG_biomass_Jenkins.
Foliage biomass ratio	foliage_ratio	A ratio that estimates biomass of the foliage on the entire tree by applying the ratio to total_AG_biomass_Jenkins.
Coarse root biomass ratio	root_ratio	A ratio that estimates biomass of the belowground portion of the tree by applying the ratio to total_AG_biomass_Jenkins.
Stump biomass	stump_biomass	An estimate of the stump biomass of a tree, from the ground to 1 foot high. Uses a series of equations that first estimates the inside and outside bark diameters, then estimates inside and outside bark volumes (Raile 1982). Wood and bark volumes are converted to biomass using specific gravity for the species.
Sapling biomass adjustment	JENKINS_SAPLING _ADJUSTMENT	An adjustment factor that is used to estimate sapling biomass for the tree by applying the factor to the total aboveground estimate, excluding foliage. The adjustment factor was computed as a national average ratio of the DRYBIOT (total dry biomass) divided by the Jenkins total biomass for all 5.0-inch trees, which is the size at which biomass, based on volume, begins. This is used on timber and woodland species.

Appendix table M-3. Jenkins Biomass Equations (Actual B1 and B2 coefficients and adjustment factors are stored in the REF_SPECIES table.) **Note**: These equations are used in appendix table M-4 to estimate the biomass components stored in the TREE table.

Component	**Equation**
total_AG_biomass_Jenkins (pounds) (total aboveground biomass, includes wood and bark for stump, bole, top, branches, and foliage)	= exp(JENKINS_TOTAL_B1 + JENKINS_TOTAL_B2 * ln(DIA*2.54)) * 2.2046
stem_ratio	= exp(JENKINS_STEM_WOOD_RATIO_B1 + JENKINS_STEM_WOOD_RATIO_B2 / (DIA*2.54))
bark_ratio	= exp(JENKINS_STEM_BARK_RATIO_B1 + JENKINS_STEM_BARK_RATIO_B2 / (DIA*2.54))
foliage_ratio	= exp(JENKINS_FOLIAGE_RATIO_B1 + JENKINS_FOLIAGE_RATIO_B2 / (DIA*2.54))
root_ratio	= exp(JENKINS_ROOT_RATIO_B1 + JENKINS_ROOT_RATIO_B2 / (DIA*2.54))
stem_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * stem_ratio
bark_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * bark_ratio
bole_biomass_Jenkins (pounds)	= stem_biomass_Jenkins + bark_ biomass_Jenkins
foliage_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * foliage_ratio
root_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins * root_ratio
stump_biomass_Jenkins (pounds)	Volumes of wood and bark are based on diameter inside bark (DIB) and DOB equations from Raile 1982. DIB = (DIA * RAILE_STUMP_DIB_B1) + (DIA * RAILE_STUMP_DIB_B2 * (4.5-HT) / (HT+1)) DOB = DIA + (DIA * RAILE_STUMP_DOB_B1 * (4.5-HT) / (HT+1)) Volume is estimated for 0.1ft (HT) slices from ground to 1 foot high (HT), and summed to compute stump volume. Bark_volume = Volume_outside_bark – Volume_inside_bark Bark and wood volumes are multiplied by their respective specific gravities and added together to estimate biomass
top_biomass_Jenkins (pounds)	= total_AG_biomass_Jenkins – stem_biomass_Jenkins – bark_biomass_Jenkins – foliage_biomass_Jenkins – stump_biomass_Jenkins

Appendix table M-4. Equations used to calculate Biomass Components stored in the TREE table

Column name	Equation (refer to appendix table M-3 for details on variables found in equations below)
	AdjFac = DRYBIO_BOLE / bole_biomass_Jenkins **AdjFac_woodland** = DRYBIO_WDLD_SPP / (total_AG_biomass_Jenkins – foliage_biomass_Jenkins)
DRYBIO_BOLE (wood and bark) (see note below) (timber species only)	VOLUME = VOLCFSND (or VOLCFGRS, VOLCFNET that are adjusted for the percent sound) Volume = includes the volume of wood from a 1-foot stump to a 4-inch top diameter = (VOLUME * (BARK_VOL_PCT / 100.0) * (BARK_SPGR_GREENVOL_DRYWT * 62.4)) + (VOLUME * (WOOD_SPGR_GREENVOL_DRYWT * 62.4))
DRYBIO_TOP (timber species only)	= top_biomass_Jenkins * **AdjFac**
DRYBIO_STUMP (timber species only)	= stump_biomass_Jenkins * **AdjFac**
DRYBIO_SAPLING (timber species only)	= (total_AG_biomass_Jenkins – foliage_biomass_Jenkins) * JENKINS_SAPLING_ADJUSTMENT
DRYBIO_WDLD_SPP (woodland species only)	With a few exceptions, woodland species are identified by REF_SPECIES.WOODLAND = X. Woodland species usually have TREE.DIAHTCD = 2 and TREE.WDLDSTEM >0. For woodland species, volume equations produce volume of wood and bark, from DRC to a 1½-inch top diameter, and includes branches. Biomass equations for each component are not available, therefore stem volume is converted to biomass and stored in DRYBIO_WDLD_SPP. This is an estimate of total aboveground biomass for woodland species, which includes wood and bark for the stem and branches and excludes foliage, the tree tip (top of the tree above 1½ inches in diameter), and a portion of the stump from the ground to the point of diameter measurement. For trees with a DRC ≥5 inches: VOLUME = VOLCFSND (or VOLCFGRS, VOLCFNET that are adjusted for the percent sound) VOLUME = includes the volume of wood, bark, and branches

	Wood and bark volumes need to be separated before converting to biomass as follows: = (VOLUME * (BARK_VOL_PCT / 100.0) * (BARK_SPGR_GREENVOL_DRYWT * 62.4)) + ((VOLUME – (VOLUME * (BARK_VOL_PCT / 100.0))) * (WOOD_SPGR_GREENVOL_DRYWT * 62.4)) For trees with a DRC <5 inches: = (total_AG_biomass_Jenkins – foliage_biomass_Jenkins) * JENKINS_SAPLING_ADJUSTMENT
DRYBIO_BG (timber and woodland species)	= root_biomass_Jenkins * **AdjFac** (for timber spp ≥5 inches DBH) = root_biomass_Jenkins * JENKINS_SAPLING_ADJUSTMENT (for timber species <5 inches DBH) = root_biomass_Jenkins * **AdjFac_woodland** (for woodland species ≥1 inch DRC)
Note: If DIA ≥ 5.0 and VOLCFSND >0 then VOLUME = VOLCFSND If DIA ≥ 5.0 and VOLCFSND = (0 or null) and VOLCFGRS >0 then VOLUME = VOLCFGRS * Percent Sound If DIA ≥ 5.0 and VOLCFSND and VOLCFGRS = (0 or null) then VOLUME = VOLCFNET * (Average ratio of cubic foot sound to cubic foot net volume, calculated as national averages by species group and diameter)	

Appendix N. 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]	ADMIN_WITHDRAWN_CD[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]	ADMIN_WITHDRAWN_CD[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	

OWNGRP[a]	OWNCD[b]	Land designation (and example)	RESERVCD[c]	ADMIN_WITHDRAWN_CD[d]	Designated by	Comments
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
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

OWNGRP[a]	OWNCD[b]	Land designation (and example)	RESERVCD[c]	ADMIN_WITHDRAWN_CD[d]	Designated by	Comments
30	all	State or local Wilderness	1		State or local Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Wilderness preclude management for timber production.
30	31	State Wild River	1		State Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Wild Rivers preclude management for timber production.
30	all	State or local Reserve	1		State or local Parks Dept	Specific areas may or may not be designated by law, but laws governing agency mandate or defining Reserves preclude management for timber production.
30	31	State Forests	0	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] ADMIN_WITHDRAWN_CD Administratively withdrawn from timber production. Timber harvest may still be allowed for other land management objectives. See description for Administratively Withdrawn Status.

* For state-specific information, please contact the individual FIA work units listed in Chapter 2, table 12.