

**The Forest Inventory and Analysis Phase 3 Indicators Database 5.1.4:  
Description and Users Manual**

November, 2012



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## Chapter 1 -- Introduction

This manual is the definitive guide to the Forest Inventory and Analysis database (FIADB) for phase 3 (P3) indicators. This document replaces the previous FIADB users manual numbered 5.1.2 (there was no version 5.1.3), and The Forest Inventory and Analysis Database: Database Description and Users Manual, Version 4.0 for P3 (Woodall et al. 2010). This document is a companion to The Forest Inventory and Analysis Database: Database Description and Users Manual, Version 5.1.4 for P2. Because of a change in field procedures that resulted in a field guide version 5.1, the FIADB version released after 4.0 is 5.1, with no version 5.0. To use the Forest Inventory and Analysis Database (FIADB) effectively, users should acquire a basic understanding of Forest Inventory and analysis (FIA) sampling and estimation procedures. Generally described, FIA uses 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 P2 plots are designated as phase 3 (P3) plots, which were formerly known as Forest Health Monitoring (FHM) plots, where additional health indicator attributes are collected. Phase 3 is described in this chapter, but phases 1 and 2 are described in a separate users manual (O’Connell et al. 2012, online). The exception is P3 crown attributes, which are described in the TREE table of the P2 document (available online at [www.fia.fs.fed.us](http://www.fia.fs.fed.us).)

Although the FIADB is used widely within the FIA program, much if not most 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 data are collected. However, as is the case with any data source, the user needs to understand not only the data definitions and acquisition methods, but also the context in which the data were collected. This manual is intended to help current and potential users understand the necessary details of the FIADB.

For specific questions about the data from a particular P3 indicator, please contact the following individuals:

Phase 3 Indicator	Phase 3 Contacts	Phone	Email
Crowns (in P2 user manual)	KaDonna Randolph	865-862-2024	krandolph@fs.fed.us
Ozone Bioindicator	John Coulston	865-862-2008	jcoulston@fs.fed.us
Lichen	Sarah Jovan	503-808-2070	sjovan@fs.fed.us
Soils	Charles Perry Michael Amacher	651-649-5191 435-755-3560	charleshperry@fs.fed.us mamacher@fs.fed.us
Vegetation Structure	Beth Schulz	907-743-9424	bschulz@fs.fed.us
Down Woody Material	Christopher Woodall	651-649-5141	cwoodall@fs.fed.us

Additional information about the P3 indicators is also available in the following publications:

- Crown condition classification: a guide to data collection and analysis (Schomaker et al. 2007)
- Ozone bioindicator: sampling and estimation (Smith et al. 2007); data analysis and interpretation (Smith et al. 2008)

- Soils as an indicator of forest health: a guide to the collection, analysis, and interpretation of soil indicator data in the Forest Inventory and Analysis Program (O'Neill et al. 2005)
- Sampling protocols, estimation procedures, and analytical guidelines for down woody materials indicator of the Forest Inventory and Analysis Program, 2<sup>nd</sup> edition (Woodall and Monleon 2008)
- Sampling and estimation procedures for the vegetation diversity and structure indicator (Schulz et al. 2009)
- General P3 program overview and update (Woodall et al. 2011)

## **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 the new 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. Because of these concerns, FIA temporarily stopped providing public access to plot coordinates. However, a revised policy has been implemented and new methods have been developed for making approximate coordinates available for all plots. These methods are collectively known as “fuzzing and swapping” (Lister et al. 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. 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 to meet privacy requirements. 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 because only the coordinates of the plot are swapped – all the other plot characteristics remain the same. The only difference will occur when users want to subdivide a county using a polygon. Even then, results will be similar because swapped plots are chosen to be similar based on attributes such as forest type, stand-size class, latitude, and longitude (each FIA unit has chosen its own attributes for defining similarity).

For plot data collected under the new annual system, plot numbers are reassigned to sever the link to other coordinates stored in the FIADB before the change in the law. Private plots are also swapped using the method described above – remeasured annual plots are swapped independently of the periodic data. All annual plot coordinates are fuzzed, but less than before: within 0.5 miles for most plots and up to 1.0 mile on a small subset of

them. This makes 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 for performing analyses by user-defined polygons and for relating FIA plot data to other map-based information, such as soils maps and satellite imagery. 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.

### Changes in version 5.1

Modifications to attribute descriptions were made in several tables. Highlights of changes are listed below.

Table Name	Attribute Name	Action
SOILS_SAMPLE_LOC	SOILS_STATCD	Added code 11
SOILS_LAB	EXCHNG_S	Modified Oracle data type
VEG_PLOT_SPECIES	COUNTYCD	Modified Oracle data type
VEG_PLOT_SPECIES		Deleted foreign key (VBS_VVT_FK)
VEG_SUBPLOT	COMMUNITY_DESC_SPECIMEN_LABEL	Deleted this attribute
REF_PLANT_DICTIONARY	US_NATIVITY	Modified Oracle data type
REF_PLANT_DICTIONARY	STATE_AND_PROVINCE	Added this attribute
REF_PLANT_DICTIONARY	SCIENTIFIC_NAME_W_AUTHOR	Added this attribute
REF_PLANT_DICTIONARY	GENERS_BINOMIAL_AUTHOR	Added this attribute
REF_PLANT_DICTIONARY	TRINOMIAL_AUTHOR	Added this attribute
REF_PLANT_DICTIONARY	QUADRINOMIAL_AUTHOR	Added this attribute
REF_PLANT_DICTIONARY	XSUBSPECIES	Added this attribute
REF_PLANT_DICTIONARY	XVARIETY	Added this attribute
REF_PLANT_DICTIONARY	SUBVAR	Added this attribute
REF_PLANT_DICTIONARY	SUBVARIETY	Added this attribute
REF_PLANT_DICTIONARY	F	Added this attribute
REF_PLANT_DICTIONARY	FORMA	Added this attribute
REF_PLANT_DICTIONARY	NOTES	Added this attribute
REF_PLANT_DICTIONARY	MANUAL_START	Deleted this attribute
REF_PLANT_DICTIONARY	MANUAL_END	Deleted this attribute
DWM_DUFF_LITTER_FUEL		Corrected unique key abbreviated notation

## Changes in version 5.1.1

Modifications to attribute descriptions were made in several tables. Highlights of changes are listed below.

<b>Table Name</b>	<b>Attribute Name</b>	<b>Action</b>
DWM_COARSE_WOODY_DEBRIS	CONDID	Added this attribute
DWM_COARSE_WOODY_DEBRIS	HORIZ_DIST	Added this attribute
DWM_COARSE_WOODY_DEBRIS	VOLCFGRS	Added this attribute
DWM_COARSE_WOODY_DEBRIS	DRYBIOT	Added this attribute
DWM_COARSE_WOODY_DEBRIS	CARBON	Added this attribute
DWM_COARSE_WOODY_DEBRIS	COVER_PCT	Added this attribute
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_UNADJ	Added this attribute
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_PLOT	Added this attribute
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_COND	Added this attribute
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_UNADJ_P2	Added this attribute
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_PLOT_P2	Added this attribute
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_COND_P2	Added this attribute
DWM_COARSE_WOODY_DEBRIS	COVER_PCT_P2	Added this attribute
DWM_COARSE_WOODY_DEBRIS	CHRCO_PNWRS	Added this attribute
DWM_COARSE_WOODY_DEBRIS	ORNTCD_PNWRS	Added this attribute
DWM_DUFF_LITTER_FUEL	CONDID	Added this attribute
DWM_FINE_WOODY_DEBRIS	SMALL_TL_COND	Added this attribute
DWM_FINE_WOODY_DEBRIS	SMALL_TL_PLOT	Added this attribute
DWM_FINE_WOODY_DEBRIS	SMALL_TL_UNADJ	Added this attribute
DWM_FINE_WOODY_DEBRIS	MEDIUM_TL_COND	Added this attribute
DWM_FINE_WOODY_DEBRIS	MEDIUM_TL_PLOT	Added this attribute
DWM_FINE_WOODY_DEBRIS	MEDIUM_TL_UNADJ	Added this attribute
DWM_FINE_WOODY_DEBRIS	LARGE_TL_COND	Added this attribute
DWM_FINE_WOODY_DEBRIS	LARGE_TL_PLOT	Added this attribute
DWM_FINE_WOODY_DEBRIS	LARGE_TL_UNADJ	Added this attribute
DWM_RESIDUAL_PILE	VOLCFGRS	Added this attribute
DWM_RESIDUAL_PILE	DRYBIOT	Added this attribute
DWM_RESIDUAL_PILE	CARBON	Added this attribute
DWM_RESIDUAL_PILE	PILES_AC_UNADJ	Added this attribute
DWM_RESIDUAL_PILE	PILES_AC_PLOT	Added this attribute
DWM_RESIDUAL_PILE	PILES_AC_COND	Added this attribute

## Changes in version 5.1.2

Additional changes were made in FIADB version 5.1.2 and are documented in this revision of the 5.1 database manual.

- Appendix A. Index of Column Names was updated.
- The tabulations below summarize other major modifications to FIADB 5.1.2.

Database tables added in FIADB V5.1.2

Name of table added	Table description
COND_DWM_CALC	Condition Down Woody Debris Calculation

Database tables with attributes added in FIADB 5.1.2

Name of table affected	Name of column added to table
DWM_TRANSECT_SEGMENT	HORIZ_BEGNDIST
DWM_TRANSECT_SEGMENT	HORIZ_ENDDIST

Database tables with attribute name changes in FIADB 5.1.2

Name of table affected	Old name	New name
DWM_COARSE_WOODY_DEBRIS	VOLCFGRS	VOLCF
DWM_COARSE_WOODY_DEBRIS	DRYBIOT	DRYBIO
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_UNADJ	LPA_UNADJ
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_PLOT	LPA_PLOT
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_COND	LPA_COND
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_UNADJ_P2	LPA_UNADJ_RGN
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_PLOT_P2	LPA_PLOT_RGN
DWM_COARSE_WOODY_DEBRIS	LOGS_AC_COND_P2	LPA_COND_RGN
DWM_COARSE_WOODY_DEBRIS	COVER_PCT_P2	COVER_PCT_RGN
DWM_RESIDUAL_PILE	VOLCFGRS	VOLCF
DWM_RESIDUAL_PILE	DRYBIOT	DRYBIO
DWM_RESIDUAL_PILE	PILES_AC_UNADJ	PPA_UNADJ
DWM_RESIDUAL_PILE	PILES_AC_PLOT	PPA_PLOT
DWM_RESIDUAL_PILE	PILES_AC_COND	PPA_COND
DWM_TRANSECT_SEGMENT	BEGNDIST	SLOPE_BEGNDIST
DWM_TRANSECT_SEGMENT	ENDDIST	SLOPE_ENDDIST
DWM_TRANSECT_SEGMENT	HORIZDIST	HORIZ_LENGTH

Database tables and attributes with description changes/additions in FIADB 5.1.2

Name of table affected	Attribute name	Action
SOILS_LAB	EXCHNG_NA	Modified Oracle data type
SOILS_LAB	EXCHNG_MG	Modified Oracle data type
DWM_COARSE_WOODY_DEBRIS	PLOT	Modified description
DWM_COARSE_WOODY_DEBRIS	SUBP	Modified description
DWM_COARSE_WOODY_DEBRIS	TRANSECT	Modified description
DWM_COARSE_WOODY_DEBRIS	CWDID	Modified description

<b>Name of table affected</b>	<b>Attribute name</b>	<b>Action</b>
DWM_COARSE_WOODY_DEBRIS	SLOPDIST	Modified description
DWM_COARSE_WOODY_DEBRIS	SPCD	Modified description
DWM_COARSE_WOODY_DEBRIS	DECAYCD	Modified description
DWM_COARSE_WOODY_DEBRIS	TRANSDIA	Modified description
DWM_COARSE_WOODY_DEBRIS	SMALLDIA	Modified description
DWM_COARSE_WOODY_DEBRIS	LARGEDIA	Modified description
DWM_COARSE_WOODY_DEBRIS	LENGTH	Modified description
DWM_COARSE_WOODY_DEBRIS	HOLLOWCD	Modified Description
DWM_COARSE_WOODY_DEBRIS	VOLCFGRS	Modified Description
DWM_COARSE_WOODY_DEBRIS	DRYBIOT	Modified Description
DWM_COARSE_WOODY_DEBRIS	CARBON	Modified Description
DWM_COARSE_WOODY_DEBRIS	COVER_PCT	Modified Description
DWM_COARSE_WOODY_DEBRIS	VOLCF	Modified Description
DWM_COARSE_WOODY_DEBRIS	DRYBIO	Modified Description
DWM_COARSE_WOODY_DEBRIS	LPA_UNADJ	Modified Description
DWM_COARSE_WOODY_DEBRIS	LPA_PLOT	Modified Description
DWM_COARSE_WOODY_DEBRIS	LPA_COND	Modified Description
DWM_COARSE_WOODY_DEBRIS	LPA_UNADJ_RGN	Modified Description
DWM_COARSE_WOODY_DEBRIS	LPA_PLOT_RGN	Modified Description
DWM_COARSE_WOODY_DEBRIS	LPA_COND_RGN	Modified Description
DWM_COARSE_WOODY_DEBRIS	COVER_PCT_RGN	Modified Description
DWM_DUFF_LITTER_FUEL	PLOT	Modified description
DWM_DUFF_LITTER_FUEL	SUBP	Modified description
DWM_DUFF_LITTER_FUEL	SMPLOCCD	Modified description
DWM_DUFF_LITTER_FUEL	SMPLCD	Modified description
DWM_DUFF_LITTER_FUEL	DUFFDEP	Modified description
DWM_DUFF_LITTER_FUEL	LITTDEP	Modified description
DWM_DUFF_LITTER_FUEL	FUELDEP	Modified description
DWM_FINE_WOODY_DEBRIS	PLOT	Modified description
DWM_FINE_WOODY_DEBRIS	SUBP	Modified description
DWM_FINE_WOODY_DEBRIS	SMALLCT	Modified description
DWM_FINE_WOODY_DEBRIS	MEDIUMCT	Modified description
DWM_FINE_WOODY_DEBRIS	LARGECT	Modified description
DWM_FINE_WOODY_DEBRIS	RSNCTCD	Modified description
DWM_FINE_WOODY_DEBRIS	PILESCD	Modified description
DWM_FINE_WOODY_DEBRIS	SMALL_TL_COND	Modified description
DWM_FINE_WOODY_DEBRIS	SMALL_TL_PLOT	Modified description
DWM_FINE_WOODY_DEBRIS	SMALL_TL_UNADJ	Modified description
DWM_FINE_WOODY_DEBRIS	MEDIUM_TL_COND	Modified description
DWM_FINE_WOODY_DEBRIS	MEDIUM_TL_PLOT	Modified description
DWM_FINE_WOODY_DEBRIS	MEDIUM_TL_UNADJ	Modified description
DWM_FINE_WOODY_DEBRIS	LARGE_TL_COND	Modified description
DWM_FINE_WOODY_DEBRIS	LARGE_TL_PLOT	Modified description
DWM_FINE_WOODY_DEBRIS	LARGE_TL_UNADJ	Modified description
DWM_MICROPLOT_FUEL	PLOT	Modified description
DWM_MICROPLOT_FUEL	SUBP	Modified description
DWM_RESIDUAL_PILE	PLOT	Modified description
DWM_RESIDUAL_PILE	SUBP	Modified description
DWM_RESIDUAL_PILE	PILE	Modified description
DWM_RESIDUAL_PILE	CONDID	Modified description
DWM_RESIDUAL_PILE	SHAPCD	Modified description
DWM_RESIDUAL_PILE	HEIGHT1	Modified description
DWM_RESIDUAL_PILE	WIDTH1	Modified description
DWM_RESIDUAL_PILE	LENGTH1	Modified description
DWM_RESIDUAL_PILE	HEIGHT2	Modified description

<b>Name of table affected</b>	<b>Attribute name</b>	<b>Action</b>
DWM_RESIDUAL_PILE	WIDTH2	Modified description
DWM_RESIDUAL_PILE	LENGTH2	Modified description
DWM_RESIDUAL_PILE	VOLCF	Modified description
DWM_RESIDUAL_PILE	DRYBIO	Modified description
DWM_RESIDUAL_PILE	PPA_UNADJ	Modified description
DWM_RESIDUAL_PILE	PPA_PLOT	Modified description
DWM_RESIDUAL_PILE	PPA_COND	Modified description
DWM_RESIDUAL_PILE	MODIFIED_DATE	Changed order in table
DWM_RESIDUAL_PILE	MODIFIED_IN_INSTANCE	Changed order in table
DWM_TRANSECT_SEGMENT	PLOT	Modified description
DWM_TRANSECT_SEGMENT	SUBP	Modified description
DWM_TRANSECT_SEGMENT	TRANSECT	Modified description
DWM_TRANSECT_SEGMENT	SEGMNT	Modified description
DWM_TRANSECT_SEGMENT	SLOPE_BEGNDIST	Modified description
DWM_TRANSECT_SEGMENT	SLOPE_ENDDIST	Modified description
DWM_TRANSECT_SEGMENT	SLOPE	Modified description
DWM_TRANSECT_SEGMENT	HORIZ_LENGTH	Modified description
DWM_TRANSECT_SEGMENT	MODIFIED_DATE	Changed order in table
DWM_TRANSECT_SEGMENT	MODIFIED_IN_INSTANCE	Changed order in table

## Chapter 2 -- Database Structure

### Keys Presented with the Tables

Each summarized table in this chapter 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<sup>1</sup> table.

The primary key in each FIADB 5.1 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
OZONE_PLOT	NOP
OZONE_VISIT	OVT
OZONE_VALIDATION	OVN
OZONE_BIOSITE_SUMMARY	OBS
OZONE_PLOT_SUMMARY	OPS
OZONE_SPECIES_SUMMARY	OSY
LICHEN_VISIT	LVT
LICHEN_LAB	LCH
LICHEN_PLOT_SUMMARY	LPS
LICHEN_SPECIES_SUMMARY	LSY
REF_LICHEN_SPECIES	LNS
REF_LICHEN_SPP_COMMENTS	LCM
SOILS_VISIT	SVT
SOILS_EROSION	SEN
SOILS_SAMPLE_LOC	SSL
SOILS_LAB	SLB
VEG_VISIT	VVT
VEG_PLOT_SPECIES	VPS
VEG_SUBPLOT	VSF
VEG_QUADRAT	VQT
VEG_SUBPLOT_SPP	VSS
REF_PLANT_DICTIONARY	RPD
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

<sup>1</sup> 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.

### **Unique key**

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

The unique key varies for each FIADB 5.1 table. The unique key for the OZONE\_PLOT table is STATECD, COUNTYCD, O3PLOT, and INVYR. The unique key for the OZONE\_VALIDATION table is PLT\_CN and BIOSPCD.

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 unique key made from existing attributes in the table.

Not all FIADB 5.1 tables have a natural key. For example, there is no natural key in the OZONE\_PLOT table; rather, the natural key and the unique key are the same.

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 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 LICHEN\_VISIT table for a specific plot, there needs to be a corresponding data row for that same plot in the PLOT table (P2). The foreign key in the LICHEN\_VISIT table is the attribute PLT\_CN, which links specific rows in the LICHEN\_VISIT table to one record in the PLOT table using the plot attribute CN.

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.

Some tables in FIADB 5.1 have only one foreign key, but tables can have multiple foreign keys.

## Ozone Bioindicator General Introduction

Unlike other FIA data where only a portion of the plots are sampled each year, every ozone site is sampled annually. Therefore, the ozone bioindicator data provide annual statistics that can be used to report on regional trends in ozone stress. The terms biosite or ozone biomonitoring site are used to refer to the ozone plot or ground location where ozone data are collected. The biosite summary table (OZONE\_BIOSITE\_SUMMARY) provides ozone summary statistics for each ozone plot or biosite. The plot summary table (OZONE\_PLOT\_SUMMARY) provides summary statistics for each ground location. Ground location differs from biosite when the data from two nearby locations are combined for a given biosite to meet the site selection requirements for the ozone indicator. The species summary table (OZONE\_SPECIES\_SUMMARY) provides summary statistics by species, at each ground location. The validation table (OZONE\_VALIDATION) contains the results of the expert review of the leaf voucher samples. The ozone visit table (OZONE\_VISIT) includes a record of plot (a single location) characteristics and measurement status. For each table, the attribute codes, computation specifications, and definitions are fully described. General guidelines for data use are presented at the beginning of each table. Annual summary statistics may be compiled by species or by biosite and reported by county, state, region, or ecoregion.

For most analyses, the biosite-level ozone injury index (BI) or BIOSITE\_INDEX is the calculated attribute that is the most useful. The biosite index is derived each year from the validated crew data and presented in the biosite summary table. The annual BI provides an indication of ozone stress for a given year, but should not be used alone to make definitive statements about ozone air quality. An examination of regional trends in ozone stress should be based on a 5-year rolling average of the biosite index. For a given 5-year period, ambient ozone concentrations may fluctuate from above normal to below normal. Calculating an average biosite index for a multi-year period ensures that the injury index used to describe plant response to ozone is a truly representative value.

In addition to the summary tables, two map products are made available annually to FIA analysts and other users. The map products are derived from weighted data that are not readily available (contact the National Ozone Indicator Advisor for more information), and true plot locations that are not in the public domain. The first map product is the national ozone risk map. Every year, geostatistical procedures are applied to the 5-year rolling average of the biosite index to interpolate a surface of biological response to ozone across the landscape. The resulting ozone risk map can be used to assign an estimated biosite index value to any mapped surface, including the FIA P2 (P2) sample. The second map product is an interpolated surface of ambient ozone concentrations (e.g., SUM06 data, which are hourly ozone concentrations greater than or equal to 0.06 parts per million O<sub>3</sub>). Regional analysts can clip their area of interest (e.g., State, region, or ecoregion) from these two map products, and use the procedures outlined in the ozone estimation document (Smith et al. 2007) and user guide (Smith et al. 2008) to calculate and interpret population metrics for the ozone indicator. Population metrics for the ozone indicator include, but are not limited to (1) the acres of forest land at low, moderate, and

high risk of ozone injury, and (2) the volume of ozone susceptible species at low, moderate, and high risk of ozone injury.

FIA uses the national ozone risk map to generate an estimated BI value for forested ground plots on the FIA P2 grid. Using the map surface and the interpolated biosite index, any user can examine relationships between the ozone indicator and other FIA indicators of tree growth, forest health, and forest condition. Similarly, the national ozone risk map (first map product) can be used in conjunction with the interpolated surface of ambient ozone concentrations (second map product) to help interpret FIA findings. Overlays are also possible with other external databases or map surfaces such as climate or seasonal drought. The goal is to ensure national consistency in published map products and interpretive reports on the ozone indicator.

Two general technical reports published by FIA include detailed information on historical changes to the ozone grid sample and specific guidance on analyzing and interpreting ozone indicator variables and associated databases (Smith et al. 2007, Smith et al. 2008). A peer-reviewed publication gives an example of how to use the BI data to assess regionwide ozone effects on ozone-sensitive tree species (Coulston et al. 2003). To download these and other documents relevant to the ozone indicator go to: <http://fia.fs.fed.us>, and click on Program Features, Forest Health Indicators, Ozone, Ozone Indicator Website (bottom of page) and then click on the publications link on the right side of the page.

### Ozone Plot Table (Oracle table name is OZONE\_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	INVYR	Inventory year	NUMBER(4)
5	STATECD	State code	NUMBER(4)
6	UNITCD	Unit code	NUMBER(2)
7	COUNTYCD	County code	NUMBER(3)
8	O3PLOT	Ozone plot	NUMBER
9	FIELD_ID	Field identification number	NUMBER(7)
10	SPLIT_PLOTID	Split plot identification	NUMBER(1)
11	MEASYEAR	Measurement year	NUMBER(4)
12	MEASMON	Measurement month	NUMBER(2)
13	MEASDAY	Measurement day	NUMBER(2)
14	LAT	Latitude	NUMBER(8,6)
15	LON	Longitude	NUMBER(9,6)
16	ELEVATION	Elevation	NUMBER
17	MANUAL	Field guide (manual) version number	NUMBER(3,1)
18	QA_STATUS	Quality assurance status	NUMBER(1)
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)
25	CYCLE	Inventory cycle number	NUMBER(2)
26	SUBCYCLE	Inventory subcycle number	NUMBER(2)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	NOP_PK
Unique	STATECD, INVYR, COUNTYCD, O3PLOT, FIELD_ID, SPLIT_PLOTID	N/A	NOP_UK
Foreign	SRV_CN	OZONE_PLOT to SURVEY	NOP_SRV_FK
	CTY_CN	OZONE_PLOT to COUNTY	NOP_CTY_FK

1. CN Sequence number. A unique sequence number used to identify an ozone 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 ozone plot record to the county record. The COUNTY table is described in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
4. INVYR Inventory year. The year in which ozone data were collected.
5. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
6. UNITCD Survey unit code. Forest Inventory and Analysis survey unit identification number. Survey units are usually groups of counties within each state. For periodic inventories, survey units may be made up of lands of particular owners. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
7. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
8. O3PLOT Ozone plot. A unique identifier for an ozone biosite that is a concatenation of FIELD\_ID and SPLIT\_PLOTID. It can be used in combination with STATECD, COUNTYCD, and INVYR to identify an ozone biomonitoring site. When a biosite is split, O3PLOT is the same for both locations, except for the last digit, which will be a 1 or 2.

9. **FIELD\_ID** Field identification number. A system-generated number used to identify a biosite. There will be more than one record with a given FIELD\_ID value when two locations are sampled for one biosite.
10. **SPLIT\_PLOTID**  
 Split plot identification. A number used to identify the distinct locations sampled for a particular biosite. SPLIT\_PLOTID = 1 identifies either a single location biosite or the first location of a biosite split between two locations. SPLIT\_PLOTID = 2 identifies the second location of a biosite split between two locations. The second location is added by the field crew to increase species and plant counts for an ozone biosite.
11. **MEASYEAR** Measurement year. The year in which the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.
12. **MEASMON** Measurement month. The month in which the plot was completed.
- | Code | Month    | Code | Month     |
|------|----------|------|-----------|
| 01   | January  | 07   | July      |
| 02   | February | 08   | August    |
| 03   | March    | 09   | September |
| 04   | April    | 10   | October   |
| 05   | May      | 11   | November  |
| 06   | June     | 12   | December  |
13. **MEASDAY** Measurement day. The day of the month in which the plot was completed.
14. **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 within +/- 8.5 miles of the actual latitude and longitude, and the attribute is in the correct county.
15. **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 within +/- 8.5 miles of the actual latitude and longitude, and the attribute is in the correct county.
16. **ELEVATION** Elevation. Elevation data are obtained either by using a global positioning system (GPS) unit or a USGS topographic map (generally the 7½ minute series quadrangle). Field crews locate the area where most of the bioindicator species are growing and record elevation to the nearest foot.

17. **MANUAL** Manual (field guide) version number. Version number of the field guide used to describe procedures for collecting data on the plot.

18. **QA\_STATUS** QA status. A code indicating the type of plot data collected. Production plots have QA\_STATUS = 1 or 7.

<b>Code</b>	<b>Quality assurance status</b>
1	Standard ozone plot
2	Cold check
4	Training/practice plot (off grid)
5	Botched plot file
6	Blind check
7	Production plot (hot check)

19. **CREATED\_BY**

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

20. **CREATED\_DATE**

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

21. **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.

22. **MODIFIED\_BY**

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

23. **MODIFIED\_DATE**

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

24. **MODIFIED\_IN\_INSTANCE**

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

25. **CYCLE** Inventory cycle number. A number assigned to a set of plots, measured over a particular period of time from which a state estimate using all possible plots is obtained. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.
26. **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.

## **Ozone Visit Table (Oracle table name is OZONE\_VISIT)**

The attributes in this table identify characteristics of the biosite with respect to site conditions evaluated by the field crew and indicates whether the data are part of the production sample or quality assurance sample. Most ozone biosites consist of a single ground location. Occasionally, two locations are used to increase species and plant counts for an ozone biosite. If two locations are used, they are within 3 miles of each other. The field identification number (FIELD\_ID) is the same for both locations, but they have different split plot identification (SPLIT\_PLOTID) numbers. O3PLOT is a concatenation of FIELD\_ID and SPLIT\_PLOTID that can be used in combination with STATECD, COUNTYCD, and INVYR to uniquely identify each plot or ground location. For each ground location, coded site characteristics include plot size (PLTSIZE), aspect (ASPECT), terrain position (TERRPOS), soil depth (SOILDPTH), soil drainage (SOILDRN), plot wetness (PLOTWET), and plot disturbance (PLTDSTRB). These site attributes are defined below. The injury check (INJCHECK) attribute indicates whether or not ozone injury was observed on non-tallied plants or species. For example, the field crew may observe ozone injury on a species after 30 records of no injury (zero values) have already been observed for that species. This attribute allows a biosite to be identified as impacted by ozone (i.e., injury detected on non-tallied plants) even though there are no quantitative data on injury amount or injury severity for trend analyses.

The grid density (GRIDDEN) and sample kind (SMPKNDCD) attributes are artifacts of the conversion from the P3 grid to the 2002 Ozone Grid. They provide information on whether or not the biosite is newly established, and whether or not there is more than one biosite within the boundaries of a given ozone grid polygon. The application of the SMPKNDCD attribute was modified in 2006 so that it could be used in conjunction with geographical coordinates entered by the field crew to signal whether or not new fuzzed coordinates are needed for the FIADB. Field crews are trained to replace sites that become overgrown or disturbed. When SMPKNDCD indicates site replacement and the distance between the previous ground location and the new ground location exceeds 3 miles, new fuzzed coordinates are needed. The distance of 3 miles reflects the area within which it is reasonable to assume a stable air quality regime. Biosites in the southern states, where open areas tend to become rapidly overgrown, are relocated more frequently than in any other region. Changes in ground location are represented by the OZONE\_BIOSITE\_SUMMARY.GROUND\_LOC\_CD, which tracks the number of times the biosite has moved and, in combination with INVYR, tracks the years in which data were collected at each location.

	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	O3PLOT	Ozone plot	NUMBER
7	FIELD_ID	Field identification number	NUMBER(7)
8	SPLIT_PLOTID	Split plot identification	NUMBER(1)
9	SMPKND CD	Ozone sample kind code	NUMBER(2)
10	MEASDAY	Measurement day	NUMBER(2)
11	MEASMON	Measurement month	NUMBER(2)
12	MEASYEAR	Measurement year	NUMBER(4)
13	PLTSIZE	Plot size	NUMBER
14	ASPECT	Aspect	NUMBER(3)
15	TERRPOS	Terrain position	NUMBER
16	SOILDPTH	Soil depth	NUMBER
17	SOILDRN	Soil drainage	NUMBER
18	PLTDSTRB	Plot disturbance	NUMBER
19	CRWTYPCD	Crew type code	NUMBER(1)
20	PLOTWET	Plot wetness	NUMBER
21	INJCHECK	Injury check	NUMBER(2)
22	GRIDDEN	Ozone grid density	NUMBER(1)
23	CREATED_BY	Created by	VARCHAR2(30)
24	CREATED_DATE	Created date	DATE
25	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
26	MODIFIED_BY	Modified by	VARCHAR2(30)
27	MODIFIED_DATE	Modified date	DATE
28	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	OVT_PK
Unique	PLT_CN	N/A	OVT_UK
Natural	STATECD, INVYR, COUNTYCD, O3PLOT, FIELD_ID, SPLIT_PLOTID	N/A	OVT_NAT_I
Foreign	PLT_CN	OZONE_VISIT to OZONE_PLOT	OVT_NOP_FK

1. CN Sequence number. A unique sequence number used to identify an ozone visit record.
2. PLT\_CN Plot sequence number. A unique sequence number used to relate the ozone visit record to the ozone plot record.
3. INVYR Inventory year. The year in which the ozone data were collected. All the plots in the ozone grid are measured every year.
4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
6. O3PLOT Ozone plot. A unique identifier for an ozone biosite that is a concatenation of FIELD\_ID and SPLIT\_PLOTID. It can be used in combination with STATECD, COUNTYCD, and INVYR to identify an ozone biomonitoring site. When a biosite is split, O3PLOT is the same for both locations except for the last digit, which will be a 1 or 2.
7. FIELD\_ID Field identification number. A system-generated number used to identify a biosite. There will be more than one record with a given FIELD\_ID value when two locations are sampled for one biosite.
8. SPLIT\_PLOTID  
  
Split plot identification. A number used to identify the distinct locations sampled for a particular biosite. SPLIT\_PLOTID = 1 identifies either a single location biosite or the first location of a biosite split between two locations. SPLIT\_PLOTID = 2 identifies the second location of a biosite split between two locations. The second location is added by the field crew to increase species and plant counts for an ozone biosite.
9. SMPKNDCD Ozone sample kind code. A code indicating the kind of sample being taken. SMPKNDCD has a value of 1 when an ozone plot is established in a previously empty polygon. SMPKNDCD has a

value of 2 when remeasurement occurs at the same location, or when the replacement plot is within 3 miles of the previously established plot. SMPKNDCD has a value of 3 when the replacement plot is more than 3 miles away from the previously established plot.

**Code Ozone sample kind**

- 1 Initial biosite establishment on the base grid or on a newly intensified grid
- 2 Remeasurement of a previously established biosite, or replacement biosite within 3 miles of the previously established plot
- 3 Replacement biosite; used when the replacement biosite is more than 3 miles from the previously established plot

10. MEASDAY Measurement day. The day of the month on which the plot was completed.

11. MEASMON Measurement month. The month on which the plot was completed.

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

12. MEASYEAR Measurement year. The year in which the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.

13. PLTSIZE Plot size. A code indicating the size of the opening used for biomonitoring. Open areas that are more than 3 acres in size are ideal because they optimize ozone air mixture. Uniform, open areas with a wide selection of bioindicator species are relatively easy to find in eastern FIA regions, but more difficult to find in western FIA regions. For data from 2002 to the present, the PLTSIZE codes are:

<b>Code</b>	<b>Plot size</b>
1	Greater than three acres
2	Greater than one acre, but less than three acres

For data before 2002, the PLTSIZE codes are:

<b>Code</b>	<b>Plot size</b>
1	Greater than three acres
2	One half to three acres
3	Less than half an acre
4	Under forest canopy, no opening

14. ASPECT Aspect. The direction of slope, to the nearest degree, for most of the condition. North is recorded as 360. When slope is less than 5%, there is no aspect and ASPECT is set to zero. The majority of biosites in eastern regions have no aspect whereas conditions in western regions are more variable. There are no published reports that suggest the direction of slope has a significant bearing on the ozone indicator. However, in western regions, north- or east-facing slopes indicate drier plot moisture conditions than south- or west-facing slopes, and plot moisture can have a significant influence on plant response to ozone.

15. TERRPOS Terrain position. A code indicating the position of the biosite in relation to the surrounding topography. Eastern biosites are often located on flatland. In the west, the terrain may be more varied.

<b>Code</b>	<b>Terrain position</b>
1	Ridge top or upper slope
2	Bench or level area along a slope
3	Lower slope
4	Flat land unrelated to slope
5	Bottom land with occasional flooding

16. SOILDPTH Soil depth. A code indicating the general depth of the soil where most of the bioindicator species are growing. Soil that is generally shallow may be subject to more frequent and severe drought, thereby mitigating the response of bioindicator species to ambient ozone exposures.

<b>Code</b>	<b>Soil depth</b>
1	Bedrock is not exposed
2	Bedrock is exposed; soil is generally shallow

17. SOILDRN Soil drainage. A code indicating the general soil drainage conditions where most of the bioindicator species are growing. The response of bioindicator species to ambient ozone exposures is optimized on soils that are well drained. This attribute is used for eastern FIA regions.

<b>Code</b>	<b>Soil drainage</b>
1	Soil is well drained
2	Soil is excessively wet
3	Soil is excessively dry

18. PLTDSTRB Plot disturbance. A code indicating the presence and kind of disturbance where most of the bioindicator species are growing. The response of bioindicator species to ambient ozone exposures is optimized on sites with no recent or significant disturbance. The area affected by any human-caused or natural disturbance must be

clearly visible and recent enough to influence plant health and condition. Disturbance that results in significant soil compaction may mitigate the response of bioindicator species to ambient ozone exposures and is considered especially significant. Crews are trained to replace biosites that have been disturbed.

**Code Plot disturbance**

- 0 No recent or significant disturbance
- 1 Evidence of overuse; human activity causing obvious soil compaction or erosion
- 2 Evidence of natural disturbance including fire, wind, flooding, grazing, pests, etc.

19. CRWTYPCD Crew type code. A code indicating the type of crew measuring the plot. If the data collected by the crew are not intended for quality assurance purposes, then the crew is specified as a regular field crew. If the biosite is revisited for quality assurance purposes, then the field crew is specified as a QA field crew.

**Code Crew type**

- 1 Regular field crew
- 2 QA field crew

20. PLOTWET Plot wetness. A code indicating the degree of wetness where most of the bioindicator species are growing. Very dry or exposed sites may mitigate the response of bioindicator species to ambient ozone exposures. This attribute is used for western FIA regions.

**Code Plot wetness**

- 1 Wet or damp (riparian zones, damp areas along a stream or meadow)
- 2 Moderately dry (grassland, meadow, or east-facing slopes)
- 3 Very dry (exposed rocky ledges, desert, and some alpine areas)

21. INJCHECK Injury check. A code indicating whether or not ozone injury was observed on non-tallied plants or species. For example, the field crew may observe ozone injury on a species after 30 records of no injury (i.e., zero values) have been recorded. This attribute allows a biosite to be identified as impacted by ozone even though there are no quantitative data on injury amount or injury severity for trend analyses. A leaf voucher must be collected from the non-tallied plant to validate the injury. The data can be used to map or tabulate the number and distribution of biosites with and without injury across a state or region.

**Code Injury check**

- 0 No injury was observed on non-tallied plants or species
- 1 Ozone injury was observed on non-tallied plants or species and a leaf voucher collected

22. GRIDDEN Ozone grid density. A code indicating whether or not the biosite is on the base ozone grid or on an intensified ozone grid. If the grid is intensified, then there is more than one biosite (O3PLOT) in a given polygon on the ozone grid.

<b>Code</b>	<b>Ozone grid density</b>
1	Unique ozone biosite within a polygon (1 biosite:1 polygon)
2	One of two or more ozone biosites within the same polygon

23. CREATED\_BY

Created by. See OZONE\_PLOT.CREATED\_BY description for definition.

24. CREATED\_DATE

Created date. See OZONE\_PLOT.CREATED\_DATE description for definition.

25. CREATED\_IN\_INSTANCE

Created in instance. See OZONE\_PLOT.CREATED\_IN\_INSTANCE description for definition.

26. MODIFIED\_BY

Modified by. See OZONE\_PLOT.MODIFIED\_BY description for definition.

27. MODIFIED\_DATE

Modified date. See OZONE\_PLOT.MODIFIED\_DATE description for definition.

28. MODIFIED\_IN\_INSTANCE

Modified in instance. See OZONE\_PLOT.MODIFIED\_IN\_INSTANCE description for definition.

### Ozone Validation Table (Oracle table name is OZONE\_VALIDATION)

The attributes in this table are part of the validation file used by the FIA data processor in each region to edit the ozone data files before they are loaded into the ozone summary tables. The biosite summary statistics do not load properly unless the validation table is complete and in accord with the raw data files entered by the field crews. The following steps describe the process. The field crew collects a leaf voucher for every species at every location where ozone injury is recorded. The leaf vouchers are mailed to an expert ozone diagnostician who reviews them, generates the ozone validation file, and returns the validation table to each region for data processing. The ozone validation table (OZONE\_VALIDATION) provides a record of whether or not the ozone injury rated by the field crews was validated for every species (BIOSPCD) at every ground location. O3PLOT is used in combination with STATECD, COUNTYCD and INVYR to uniquely identify each ground location. In some cases the leaf voucher is missing. If the injury is not validated or is missing, the crew data file is modified to reflect this fact. Occasionally, the field crew submits leaf vouchers for plants or species that are not included in the injury data file. These are considered non-tallied leaf vouchers as defined by the OZONE\_VISIT.INJCHECK attribute. If injury on non-tallied plants or species is validated, this is reflected in the validation file. Injury to non-tallied plants or species can be used only to indicate or map presence or absence of ozone injury. Only validated data from tallied plants and species are used in the computation of ozone summary statistics and other risk assessment analyses such as the national ozone risk map.

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	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	O3PLOT	Ozone plot	NUMBER
7	FIELD_ID	Field identification number	NUMBER(7)
8	SPLIT_PLOTID	Split plot identification	NUMBER(1)
9	BIOSPCD	Bioindicator species code	NUMBER
10	QASTATCD	Quality assurance status code	NUMBER(1)
11	CRWTYPCD	Crew type code	NUMBER(1)
12	LEAFVCHR	Leaf voucher	NUMBER
13	INJVALID	Injury validation	NUMBER
14	O3_STATCD	Ozone status code	NUMBER
15	MEASYEAR	Measurement year	NUMBER(4)
16	CREATED_BY	Created by	VARCHAR2(30)
17	CREATED_DATE	Created date	DATE
18	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)

Column Name	Descriptive Name	Oracle data type
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	OVN PK
Unique	PLT_CN, BIOSPCD	N/A	OVN UK
Natural	STATECD, INVYR, COUNTYCD, O3PLOT, FIELD_ID, SPLIT_PLOTID, BIOSPCD	N/A	OVN_NAT_I

1. CN                      Sequence number. A unique sequence number used to identify an ozone validation record.
2. PLT\_CN                Plot sequence number. A unique sequence number used to relate the ozone validation record to the ozone plot record
3. INVYR                 Inventory year. The year in which the ozone data were collected. All the plots in the ozone grid are measured every year
4. STATECD              State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
5. COUNTYCD            County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
6. O3PLOT                Ozone plot. A unique identifier for an ozone biosite that is a concatenation of FIELD\_ID and SPLIT\_PLOTID. It can be used in combination with STATECD, COUNTYCD, and INVYR to identify an ozone biomonitoring site. When a biosite is split, O3PLOT is the same for both locations except for the last digit, which will be a 1 or 2.

7. **FIELD\_ID** Field identification number. A system-generated number used to identify a biosite. There will be more than one record with a given FIELD\_ID value when two locations are sampled for one biosite.

8. **SPLIT\_PLOTID**

Split plot identification. A number used to identify the distinct locations sampled for a particular biosite. SPLIT\_PLOTID = 1 identifies either a single location biosite or the first location of a biosite split between two locations. SPLIT\_PLOTID = 2 identifies the second location of a biosite split between two locations. The second location is added by the field crew to increase species and plant counts for an ozone biosite.

9. **BIOSPCD** Bioindicator species code. A code indicating the bioindicator species on the biosite. Bioindicator species may be a tree, a woody shrub, or a non-woody herb species. All of the species selected for use respond to ambient levels of ozone pollution with distinct visible foliar symptoms that are easy to diagnose.

<b>Code</b>	<b>Region<sup>1</sup></b>	<b>Common Name</b>	<b>Scientific Name</b>
116	I, P	Jeffrey pine <sup>2</sup>	<i>Pinus jeffreyi</i>
122	I, P	Ponderosa pine <sup>3 4</sup>	<i>Pinus ponderosa</i>
351	I, P	Red alder <sup>2</sup>	<i>Alnus rubra</i>
364	N, S	Big Leaf Aster	<i>Aster macrophyllus: Eurybia macrophylla</i>
365	N, S	Common and Tall Milkweed	<i>Asclepias spp.</i>
366	N, S, P	Spreading Dogbane	<i>Apocynum androsaemifolium</i>
541	N, S	White Ash	<i>Fraxinus americana</i>
611	N, S	Sweetgum	<i>Liquidambar styraciflua</i>
621	N, S	Yellow Poplar	<i>Liriodendron tulipifera</i>
746	I, P	Quaking aspen	<i>Populus tremuloides</i>
761	N, S	Pin Cherry	<i>Prunus pensylvanica</i>
762	N, S	Black Cherry	<i>Prunus serotina</i>
905	I, P	Ninebark	<i>Physocarpus malvaceus</i>
906	P	Pacific Ninebark (WC) <sup>5</sup>	<i>Physocarpus capitatus</i>
907	I, P	Western wormwood	<i>Artemisia ludoviciana</i>
908	P	Mugwort	<i>Artemisia douglasiana</i>
909	I, P	Skunk bush	<i>Rhus trilobata</i>
915	N, S	Blackberry	<i>Rubus allegheniensis</i>
924	I, P	Scouler's willow	<i>Salix scouleriana</i>
931	N, S	Sassafras	<i>Sassafras albidum</i>
960	I, P	Blue elderberry <sup>6</sup>	<i>Sambucus mexicana</i>
961	I, P	Red elderberry	<i>Sambucus racemosa</i>
965	I, P	Thin leaf huckleberry	<i>Vaccinium membranaceum</i>
968	I, P	Evening primrose	<i>Oenothera elata</i>
969	I, P	Snowberry	<i>Symphoricarpos spp.</i> includes snowberry and coralberry species

Code	Region <sup>1</sup>	Common Name	Scientific Name
	998 - Supplemental species listed below.		
998		Silver maple	<i>Acer saccharinum</i>
998		Speckled alder	<i>Alnus rugosa</i>
998		Common ground nut	<i>Apios americana</i>
998		Showy milkweed	<i>Asclepias speciosa</i>
998		Trumpet creeper	<i>Campsis radicans</i>
998		Common buttonbush	<i>Cephalanthus occidentalis</i>
998		Red bud	<i>Cercis canadensis</i>
998		White snake root	<i>Eupatorium rugosum</i>
998		Woodland sunflower	<i>Helianthus divaricatus</i>
998		Spicebush	<i>Lindera benzoin</i>
998		Sourwood	<i>Oxydendron arboreum</i>
998		American plum	<i>Prunus americana</i>
998		Winged sumac	<i>Rhus copallinum</i>
998		Black Raspberry	<i>Rubus occidentalis</i>
998		Cutleaf coneflower	<i>Rudbeckia laciniata</i>
998		American (common) elderberry	<i>Sambucus canadensis</i>
998		Cup plant	<i>Silphium perfoliatum</i>
998		Basswood	<i>Tilia americana</i>
998		Crownbeard	<i>Verbesina occidentalis</i>
998		Iron weed	<i>Vernonia noveboracensis</i>
998		Nannyberry	<i>Viburnum lentago</i>
998		Northern Fox grape	<i>Vitis labrusca</i>
999		Unknown	

<sup>1</sup> Regions are N = North; S = South; I = Interior; P = Pacific Northwest

<sup>2</sup> In the Interior Region, *Pinus jeffreyi* (NV); *Alnus rubra* (ID)

<sup>3</sup> In the Interior Region, *Pinus ponderosa* var. *scopulorum* (WY, CO)

<sup>4</sup> In the Pacific Northwest Region, *Pinus ponderosa* var. *ponderosa*

<sup>5</sup> In the Pacific Northwest Region, WC = This species is only found west of the Cascades.

<sup>6</sup> In the Pacific Northwest Region, synonym for *S. mexicana* is *S. cerulea*.

10. QASTATCD Quality assurance status code. A code indicating the type of data collected at the biosite and whether or not the data are intended for quality assurance purposes. Each year, 10 biosites in each region are revisited for quality assurance purposes.

**Code Quality assurance status**

- 1 Standard field plot; data not intended for quality assurance purposes  
 6 QA field plot; data intended for quality assurance purposes

11. CRWTYPCD Crew type code. A code indicating the type of crew measuring the plot. If the data collected by the crew are not intended for quality assurance purposes, then the crew is specified as a regular field crew. If the biosite is revisited for quality assurance purposes, then the field crew collecting the remeasurement data is specified as a QA field crew.

<b>Code</b>	<b>Crew type</b>
1	Standard field crew
2	QA field crew

12. LEAFVCHR Leaf voucher. A code indicating whether or not the field crew followed the voucher preparation and mailing procedures outlined in the field guide. If procedures are not followed such that the voucher is missing or compromised by mishandling, the injury ratings for that species and site are discounted.

<b>Code</b>	<b>Leaf voucher</b>
1	The field crew followed procedures and mailed in a readable voucher
2	The leaf voucher is missing and the data indicate the crew found injury
3	The crew did not find injury and the crew mailed in a clean voucher to verify this finding

13. INJVALID Injury validation. A code indicating the validation status of the leaf voucher. The leaf samples are examined microscopically and subject to additional diagnostic tests to validate the ozone injury symptom. The results of the diagnosis are documented on the voucher data sheet, entered in an electronic file, and returned to the regions for data processing and edit checks.

<b>Code</b>	<b>Injury validation</b>
1	Ozone injury was validated by an expert either by voucher or with an on-site visit
2	Ozone injury was not validated because the symptoms are clearly not attributable to ozone or because the condition of the leaf sample makes validation questionable
3	Ozone injury was not validated because the voucher was missing
4	Ozone injury was not validated because the crew did not find injury and the leaf sample voucher sent in was uninjured

14. O3\_STATCD Ozone status code. A code indicating whether the voucher leaf samples for this biospecies were verified as positive (i.e., injury is due to ozone exposure) or negative (i.e., injury is due to something other than ozone exposure) for ozone injury. Codes 4 and 5 apply to vouchers from non-tallied plants (see OZONE\_VISIT.INJCHECK)

<b>Code</b>	<b>Ozone status</b>
1	Injury is due to ozone exposure
2	Injury is not due to ozone exposure
3	There is insufficient information to determine whether injury is due to ozone exposure (e.g., voucher leaf sample may be compromised or missing)
4	Injury is due to ozone exposure, but no injury data (>0) were recorded for this species
5	Injury is not due to ozone exposure, but no injury data (>0) were recorded for this species

If O3\_STATCD = 1, then the field data are included in summary calculations and trend analysis. If O3\_STATCD = 2, then the field data are included in summary calculations and analysis after the injury amount is set to zero and the injury severity to null for each individual of the given species on the biosite. If O3\_STATCD = 3, then the tallied field data for a given species and location are not included in summary calculations and trend analysis. If O3\_STATCD = 4, then OZONE\_VISIT.INJCHECK is set to 1 and all tallied field data are included in summary calculations and trend analysis. If O3\_STATCD = 5, then OZONE\_VISIT.INJCHECK is set to zero and all tallied field data are included in summary calculations and trend analysis.

15. MEASYEAR Measurement year. The year in which the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.
16. CREATED\_BY  
Created by. See OZONE\_PLOT.CREATED\_BY description for definition.
17. CREATED\_DATE  
Created date. See OZONE\_PLOT.CREATED\_DATE description for definition.
18. CREATED\_IN\_INSTANCE  
Created in instance. See OZONE\_PLOT.CREATED\_IN\_INSTANCE description for definition.
19. MODIFIED\_BY  
Modified by. See OZONE\_PLOT.MODIFIED\_BY description for definition.
20. MODIFIED\_DATE  
Modified date. See OZONE\_PLOT.MODIFIED\_DATE description for definition.
21. MODIFIED\_IN\_INSTANCE  
Modified in instance. See OZONE\_PLOT.MODIFIED\_IN\_INSTANCE description for definition.

### **Ozone Biosite Summary Table (Oracle table name is OZONE\_BIOSITE\_SUMMARY)**

The attributes in this table summarize ozone indicator data by biosite and year. FIELD\_ID is a system-generated number assigned to a biosite. O3PLOT is a unique identifier used in combination with STATECD, COUNTCD, and INVYR to identify a biosite. O3PLOT is the same as FIELD\_ID except the last digit of O3PLOT equals 1 when the biosite consists of one location, or 2 when the biosite consists of two locations. When two locations are used, the data from both locations are combined for the biosite summary attributes. Each biosite (O3PLOT) is associated with a location count (LOCATION\_CNT) and a ground location (GROUND\_LOC\_CD) attribute. LOCATION\_CNT has a value of 1 or 2 depending on whether the data were collected from one or two locations. GROUND\_LOC\_CD has a value of 1 or more depending on whether the ground location for a biosite has remained the same, or changed from one year to the next. Ground locations change when the open areas used for biomonitoring become overgrown or disturbed and must be replaced.

For each biosite, summary values are tabulated for the total number of species evaluated (SPECIES\_EVAL\_CNT), the total number of plants evaluated (PLANT\_EVAL\_CNT), the total number of plants injured (PLANT\_INJ\_CNT), the ratio of injured to evaluated plants (PLANT\_RATIO), the percent of sampled plants in each injury severity class (SVRTY\_CLASS\_ZERO to SVRTY\_CLASS\_FIVE), and the biosite-level ozone injury index (BIOSITE\_INDEX). These summary statistics may be used in an annual report to list how many biosites were visited, how many plants were evaluated, and how many (or percent) of the total plots and plants sustained ozone injury. Over time, these summary statistics can be used to report on regional trends in ozone stress in terms of significant changes in the number and distribution of biomonitoring plots with ozone injury, changes in injury severity classifications, and increases or decreases in the ozone injury index.

Severity classifications are based on a modified Horsfall-Barrett (HB) scale with breakpoints at 6, 25, 50, 75, and 100 percent (Horsfall and Cowling 1978). Injury severity is an estimate of the mean severity of symptoms on injured foliage as recorded by FIA field crews for individual plant samples. Calculated percents are rounded to the nearest whole number. Severity class zero = no injury; class one = 1-6 percent injury; class two = 7-25 percent; class three = 26-50 percent; class four = 51-75 percent; class 5 = more than 75 percent injury. Providing a table for each FIA reporting unit (e.g., state, ecoregion) and year that displays the number of biosites evaluated, the number of plants sampled, and the percent of sampled plants in each injury severity category is a highly defensible way to present ozone summary statistics.

Guidelines for interpreting the biosite-level ozone injury index are listed in the description of BIOSITE\_INDEX. BIOSITE\_INDEX is formulated from the injury amount and severity ratings recorded for each plant and the numbers of plants and species evaluated at each site. The BIOSITE\_INDEX gives a precise estimate of plant response and the opportunity to calculate thresholds of concern for the ozone indicator. Ozone cannot injure plants unless it enters the leaves through open stomata. Therefore, visible injury on bioindicator species (BIOSITE\_INDEX > 0) provides a biological

record of both high ozone and favorable conditions for ozone flux including adequate light, nutrition, and soil moisture. For this reason, the measured response of bioindicator plants to ambient ozone exposures is a more meaningful indicator of ozone stress and probable impact than ambient ozone concentration data obtained from physical air quality monitoring stations.

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	INVYR	Inventory Year	NUMBER(4)
3	STATECD	State code	NUMBER(4)
4	COUNTYCD	County code	NUMBER(3)
5	O3PLOT	Ozone plot	NUMBER
6	FIELD_ID	Field identification number	NUMBER(7)
7	LOCATION_CNT	Location count	NUMBER
8	GROUND_LOC_CD	Ground location code	NUMBER(1)
9	MEASYEAR	Measurement year	NUMBER(4)
10	PLANT_INJ_CNT	Plant injury count	NUMBER
11	PLANT_EVAL_CNT	Plant evaluation count	NUMBER
12	PLANT_RATIO	Plant ratio	NUMBER
13	SPECIES_EVAL_CNT	Species evaluation count	NUMBER
14	BIOSITE_INDEX	Biosite index	NUMBER
15	BIOSITE_INDEX_MULTIPLIER	Biosite index multiplier	NUMBER
16	SVRTY_CLASS_ZERO	Severity class zero	NUMBER
17	SVRTY_CLASS_ONE	Severity class one	NUMBER
18	SVRTY_CLASS_TWO	Severity class two	NUMBER
19	SVRTY_CLASS_THREE	Severity class three	NUMBER
20	SVRTY_CLASS_FOUR	Severity class four	NUMBER
21	SVRTY_CLASS_FIVE	Severity class five	NUMBER
22	CREATED_BY	Created by	VARCHAR2(30)
23	CREATED_DATE	Created date	DATE
24	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
25	MODIFIED_BY	Modified by	VARCHAR2(30)
26	MODIFIED_DATE	Modified date	DATE
27	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	OBS_PK
Unique	STATECD, INVYR, COUNTYCD, O3PLOT, FIELD_ID	N/A	OBS_UK



location, the GROUND\_LOC\_CD is increased (i.e. incremented) by 1.

9. MEASYEAR Measurement year. The year in which the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.

10. PLANT\_INJ\_CNT

Plant injury count. The number of injured plants at a biosite equals the number of plants that have injury amounts greater than zero. This value is combined across all species. Sensitivity to ozone is strongly influenced by genotype and microhabitat such that neighboring plants of the same species show very different responses to ozone exposure. At any one location, around 10 percent of a sensitive population will show a visible response to phytotoxic ozone concentrations.

PLANT\_INJ\_CNT = count (plants at an ozone plot that have an injury amount greater than zero).

11. PLANT\_EVAL\_CNT

Plant evaluation count. The number of plants evaluated equals the total number of plants examined at a biosite. This value is combined across all species. Field crews are trained to evaluate up to 30 plants of two or more species. The average number of evaluated plants at western biosites is 75. The average count for eastern biosites is 100, although many have 150 evaluated plants. It takes injury to only one plant of one species to document the occurrence of plant-damaging ozone concentrations. However, the assessment of risk to the surrounding forest is more robust when many plants of more than one species show an ozone injury response. PLANT\_EVAL\_CNT = count (all plants evaluated at an ozone plot)

12. PLANT\_RATIO

Plant ratio. The plants ratio is the ratio of the number of plants injured to the number of plants evaluated. That is, the plants ratio equals the number of plants injured divided by the number of plants evaluated. Using a ratio allows a direct comparison between biosites, states, or regions that have different sample counts. Examining the relationship between the percent injured plants and the biosite index also provides insight into whether a high injury index is the result of an acute exposure (severe injury to relatively few plants) or the result of moderate injury to a larger sample of the sensitive population.  $PLANT\_RATIO = PLANTS\_INJ\_CNT / PLANTS\_EVAL\_CNT$

### 13. SPECIES\_EVAL\_CNT

Species evaluation count. The species evaluation count equals the number of species evaluated at a biosite. Typically the number of species evaluated is 2 in the West and 3 to 5 in the East. The information obtained from different species is combined to make the biosite index a representative value for a given biosite. Furthermore, certain species are good bioindicators of elevated ozone concentrations in growing seasons with above average rainfall and others are good bioindicators in dry seasons. The goal is to maximize the opportunity to capture the ozone stress signal by evaluating as many species and plants as possible in areas close to the forests and subject to the same ozone air quality regime.

$$\text{SPECIES\_EVAL\_CNT} = \text{count (the unique species evaluated at an ozone plot)}$$

### 14. BIOSITE\_INDEX

Biosite index. The biosite index (BIOSITE\_INDEX) equals the sum of the species index (BIOSPCD\_INDEX) divided by the species evaluation count (SPECIES\_EVAL\_CNT). The information obtained from different species is combined into one injury index to make the BIOSITE\_INDEX a representative value for a given biosite. The index is not intended to be used as a measurement of harm. Rather, it provides a relative value, a gradation of response that quantifies the degree of ozone injury conditions on the FIA detection monitoring plots. In the following table, the BIOSITE\_INDEX is multiplied by 1000 and the result is classified into four categories of risk designed to capture differences in plant damage to ozone-sensitive tree species in areas of none, low, moderate, and high ozone stress where stress is defined as the confluence of interacting factors (e.g., plant properties and external growth conditions) that determine ozone flux. The assumption of risk assigned to each category represents a relative measure of probable impacts from ambient ozone exposure or a relative measure of ozone air quality with respect to forest health.

$$\text{BIOSITE\_INDEX} = \text{summation (BIOSPCD\_INDEX) / SPECIES\_EVAL\_CNT}$$

Biosite Index (multiplied by 1000)	Bioindicator response	Assumption of risk	Possible impact	Relative air quality
0 to 4.9	Little or no foliar injury	None	Visible injury to highly sensitive species, e.g., black cherry	Good
5.0 to 14.9	Light to moderate foliar injury	Low	Visible injury to moderately sensitive species, e.g., tulip poplar	Moderate
15.0 to 24.9	Moderate to severe foliar injury	Moderate	Visible and invisible injury; tree-level response	Unhealthy for sensitive species
≥ 25	Severe foliar injury	High	Visible and invisible injury; ecosystem-level response	Unhealthy

#### 15. BIOSITE\_INDEX\_MULTIPLIER

Biosite index multiplier. The biosite index multiplier is the biosite index (BIOSITE\_INDEX) multiplied by 1000 to allow the ozone risk categories to be defined by integers. Use this value in reports rather than the calculated biosite index.  $BIOSITE\_INDEX\_MULTIPLIER = BIOSITE\_INDEX * 1000$

#### 16. SVRTY\_CLASS\_ZERO

Severity class zero. The percent of all evaluated plants at a given biosite that have no symptoms of ozone-induced foliar injury.  $SVRTY\_CLASS\_ZERO = \text{count}(\text{all plants with injury severity equal to zero}) * 100 / \text{count}(\text{all plants evaluated at an ozone plot, i.e., PLANT\_EVAL\_CNT})$

#### 17. SVRTY\_CLASS\_ONE

Severity class one. The percent of all plants evaluated with an injury severity rating of 1. Injury class one may be considered slight injury.  $SVRTY\_CLASS\_ONE = \text{count}(\text{all plants with injury severity equal to 1}) * 100 / \text{count}(\text{all plants evaluated at an ozone plot, i.e., PLANT\_EVAL\_CNT})$ . A severity rating of 1 is assigned when, on average, 1 to 6 percent of the leaf area of the injured leaves have ozone damage symptoms.

#### 18. SVRTY\_CLASS\_TWO

Severity class two. The percent of all plants evaluated with a severity rating of 2. Injury class two may be considered low to

moderate ozone injury.  $SVRTY\_CLASS\_TWO = \text{count (all plants with injury severity equal to 2)} * 100 / \text{count (all plants evaluated at an ozone plot, i.e., PLANT\_EVAL\_CNT)}$ . A severity rating of 2 is assigned when, on average, 7 to 25 percent of the leaf area of the injured leaves have ozone damage symptoms.

19. SVRTY\_CLASS\_THREE

Severity class three. The percent of all plants evaluated with an injury severity rating of 3. Injury class three may be considered moderate ozone injury.  $SVRTY\_CLASS\_THREE = \text{count (all plants with injury severity equal to 3)} * 100 / \text{count (all plants evaluated at an ozone plot, i.e., PLANT\_EVAL\_CNT)}$ . A severity rating of 3 is assigned when, on average, 26 to 50 percent of the leaf area of the injured leaves have ozone damage symptoms.

20. SVRTY\_CLASS\_FOUR

Severity class four. The percent of all plants evaluated with an injury severity rating of 4. Injury class four may be considered moderate to severe ozone injury.  $SVRTY\_CLASS\_FOUR = \text{count (all plants with injury severity equal to 4)} * 100 / \text{count (all plants evaluated at an ozone plot, i.e., PLANT\_EVAL\_CNT)}$ . A severity rating of 4 is assigned when, on average, 51 to 75 percent of the leaf area of the injured leaves have ozone damage symptoms.

21. SVRTY\_CLASS\_FIVE

Severity class five. The percent of all plants evaluated with an injury severity rating of 5. Injury class five may be considered severe ozone injury.  $SVRTY\_CLASS\_FIVE = \text{count (all plants with injury severity equal to 5)} * 100 / \text{count (all plants evaluated at an ozone plot, i.e., PLANT\_EVAL\_CNT)}$ . A severity rating of 5 is assigned when, on average, greater than 75 percent of the leaf area of the injured leaves have ozone damage symptoms.

22. CREATED\_BY

Created by. See OZONE\_PLOT.CREATED\_BY description for definition.

23. CREATED\_DATE

Created date. See OZONE\_PLOT.CREATED\_DATE description for definition.

24. CREATED\_IN\_INSTANCE

Created in instance. See OZONE\_PLOT.CREATED\_IN\_INSTANCE description for definition.

25. MODIFIED\_BY

Modified by. See OZONE\_PLOT.MODIFIED\_BY description for definition.

26. MODIFIED\_DATE

Modified date. See OZONE\_PLOT.MODIFIED\_DATE description for definition.

27. MODIFIED\_IN\_INSTANCE

Modified in instance. See OZONE\_PLOT.MODIFIED\_IN\_INSTANCE description for definition.

### **Ozone Plot Summary Table (Oracle table name is OZONE\_PLOT\_SUMMARY)**

This table provides location-specific information recorded in the field or derived from the field data. The attributes in this table summarize ozone injury, species counts, and site characteristics for each ground location visited by the field crews. Ground location differs from ozone biosite because a small number of ozone biosites consist of two ground locations. Ozone biosites that consist of two locations are referred to as split plots. Two locations are used to increase species and plant counts for a single ozone biosite. If two locations are used, they are within 3 miles of each other. FIELD\_ID is the same for both locations, but they have different split plot identification numbers (SPLIT\_PLOTID). O3PLOT is a concatenation of FIELD\_ID and SPLIT\_PLOTID and can be used in combination with STATECD, INVYR, and COUNTYCD to uniquely identify each ground location. For each ground location, coded site characteristics include plot size (PLTSIZE), elevation (ELEV), aspect (ASPECT), terrain position (TERRPOS), soil depth (SOILDPTH), soil drainage (SOILDRN), plot wetness (PLOTWET), and plot disturbance (PLTDSTRB).

Ozone plots vary in size and do not have set boundaries. Crews specify the predominant site characteristics where most of the plant species are located. If conditions vary markedly across the site or by species, then this is described in the plot notes or on the site map. Elevation, aspect, terrain position, soil depth, soil drainage, plot wetness, and disturbance are specified for the highest priority species listed in the field guide. The soil depth, soil drainage, plot wetness, and disturbance attributes are intended to describe general conditions on the plot and are not based on actual measurements. Geographical coordinates that have been fuzzed (LAT and LON) are provided for each ground location. Analysts should review the OZONE\_VISIT table for additional information (SMPKNDCD, CRWTYPCD, and INJCHECK) on each ground location.

The location-specific attributes in this table provide the opportunity to examine certain site characteristics (e.g., elevation, plot size) more closely. However, for the purposes of detection monitoring reports, the preferred summary statistic is the biosite-level injury index (OZONE\_BIOSITE\_SUMMARY.BIOSITE\_INDEX).

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	INVYR	Inventory year	NUMBER(4)
3	STATECD	State code	NUMBER(4)
4	COUNTYCD	County code	NUMBER(3)
5	O3PLOT	Ozone plot	NUMBER
6	FIELD_ID	Field identification number	NUMBER(7)
7	SPLIT_PLOTID	Split plot identification	NUMBER(1)
8	MEASYEAR	Measurement year	NUMBER(4)
9	SPECIES_EVAL_CNT	Species evaluation count	NUMBER
10	BIOSITE_INDEX	Biosite index	NUMBER
11	ELEV	Elevation	NUMBER(5)
12	PLTSIZE	Plot size	NUMBER
13	ASPECT	Aspect	NUMBER(3)
14	TERRPOS	Terrain position	NUMBER
15	SOILDPATH	Soil depth	NUMBER
16	SOILDRN	Soil drainage	NUMBER
17	PLOTWET	Plot wetness	NUMBER
18	PLTDSTRB	Plot disturbance	NUMBER
19	BIOSITE_INDEX_MULTIPLIER	Biosite index multiplier	NUMBER
20	LAT	Latitude	NUMBER(8,6)
21	LON	Longitude	NUMBER(9,6)
22	CREATED_BY	Created by	VARCHAR2(30)
23	CREATED_DATE	Created date	DATE
24	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
25	MODIFIED_BY	Modified by	VARCHAR2(30)
26	MODIFIED_DATE	Modified date	DATE
27	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	OPS_PK
Unique	STATECD, INVYR, COUNTYCD, O3PLOT, FIELD_ID, SPLIT_PLOTID	N/A	OPS_UK

1. CN Sequence number. A unique sequence number used to identify an ozone plot summary record.
2. INVR Inventory year. The year in which ozone data were collected. All the plots in the ozone grid are measured every year.

3. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
4. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
5. O3PLOT Ozone plot. A unique identifier for an ozone biosite that is a concatenation of FIELD\_ID and SPLIT\_PLOTID. It can be used in combination with STATECD, COUNTYCD, and INVYR to identify an ozone biosite. When a biosite is split, O3PLOT is the same for both locations except for the last digit, which will be a 1 or a 2.
6. FIELD\_ID Field identification number. A system-generated number used to identify a biosite. There will be more than one record with a given FIELD\_ID value when two locations are sampled for one biosite.
7. SPLIT\_PLOTID  

Split plot identification. A number used to identify the distinct locations sampled for a particular biosite. SPLIT\_PLOTID = 1 identifies either a single location biosite or the first location of a biosite split between two locations. SPLIT\_PLOTID = 2 identifies the second location of a biosite split between two locations. The second location is added by the field crew to increase species and plant counts for a biosite.
8. MEASYEAR Measurement year. The year in which the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.
9. SPECIES\_EVAL\_CNT  

Species evaluation count. The species evaluation count equals the number of species evaluated at each ground location visited by the field crews. Typically the number of species evaluated is 2 in the West and 3 to 5 in the East. When the biosite is split between two locations, the number of species evaluated at any one location may be 1. SPECIES\_EVAL\_CNT = count (the unique species evaluated at a ground location)

## 10. BIOSITE\_INDEX

Biosite index. The biosite index (BIOSITE\_INDEX) equals the sum of the species index (BIOSPCD\_INDEX) divided by the species evaluation count (SPECIES\_EVAL\_CNT). The information obtained from different species is combined into one injury index to make the BIOSITE\_INDEX a representative value for a given biosite. The index is not intended to be used as a measurement of harm. Rather, it provides a relative value, a gradation of response that quantifies the degree of ozone injury conditions on the FIA detection monitoring plots. In the following table, the BIOSITE\_INDEX is multiplied by 1000 and the result is classified into four categories of risk designed to capture differences in plant damage to ozone-sensitive tree species in areas of none, low, moderate, and high ozone stress where stress is defined as the confluence of interacting factors (e.g., plant properties and external growth conditions) that determine ozone flux. The assumption of risk assigned to each category represents a relative measure of probable impacts from ambient ozone exposure, or a relative measure of ozone air quality with respect to forest health.

$$\text{BIOSITE\_INDEX} = \frac{\text{summation (BIOSPCD\_INDEX)}}{\text{SPECIES\_EVAL\_CNT}}$$

Biosite Index (multiplied by 1000)	Bioindicator response	Assumption of risk	Possible impact	Relative air quality
0 to 4.9	Little or no foliar injury	None	Visible injury to highly sensitive species, e.g., black cherry	Good
5.0 to 14.9	Light to moderate foliar injury	Low	Visible injury to moderately sensitive species, e.g., tulip poplar	Moderate
15.0 to 24.9	Moderate to severe foliar injury	Moderate	Visible and invisible injury; tree-level response	Unhealthy for sensitive species
≥ 25	Severe foliar injury	High	Visible and invisible injury; ecosystem-level response	Unhealthy

11. ELEV Elevation. Elevation data are obtained either by using a global positioning system (GPS) unit or USGS topographic maps (generally the 7½ minute series quadrangle). Field crews locate the area where most of the bioindicator species are growing and record elevation to the nearest foot.

12. PLTSIZE Plot size. A code indicating the size of the opening used for biomonitoring. Open areas that are more than 3 acres in size are ideal because they optimize ozone air mixture. Uniform, open areas with a wide selection of bioindicator species are relatively easy to find in

eastern FIA regions, more difficult to find in western FIA regions. For data from 2002 to the present, the PLTSIZE codes are:

<b>Code</b>	<b>Plot size</b>
1	Greater than three acres
2	Greater than one acre, but less than three acres

For data prior to 2002, the PLTSIZE codes are:

<b>Code</b>	<b>Plot size</b>
1	Greater than three acres
2	One half to three acres
3	Less than half an acre
4	Under forest canopy; no opening

13. **ASPECT** Aspect. The aspect attribute identifies the direction of slope for land surfaces with at least 5 percent slope as measured with a hand compass to the nearest degree (0° to 360°). The majority of biosites in eastern regions have no aspect whereas conditions in western regions are more variable. There are no published reports that suggest the direction of slope has a significant bearing on the ozone indicator. However, in western regions, north- or east-facing slopes indicate drier plot moisture conditions than south- or west-facing slopes, and plot moisture can have a significant influence on plant response to ozone.

14. **TERRPOS** Terrain position. A code indicating the position of the biosite in relation to the surrounding topography. Eastern biosites are often located on flat land. In the west, the terrain may be more varied.

<b>Code</b>	<b>Terrain position</b>
1	Ridge top or upper slope
2	Bench or level area along a slope
3	Lower slope
4	Flat land unrelated to slope
5	Bottom land with occasional flooding

15. **SOILDPTH** Soil depth. A code indicating the general depth of the soil where most of the bioindicator species are growing. Soil that is generally shallow may be subject to more frequent and severe drought, thereby mitigating the response of bioindicator species to ambient ozone exposures.

<b>Code</b>	<b>Soil depth</b>
1	Bedrock not exposed
2	Bedrock exposed; soil generally shallow

16. **SOILDRN** Soil drainage. A code indicating the general soil drainage conditions where most of the bioindicator species are growing. The response of

bioindicator species to ambient ozone exposures is optimized on soils that are well drained. This attribute is used for eastern FIA regions.

<b>Code</b>	<b>Soil drainage</b>
1	Soil is well drained
2	Soil is generally wet
3	Soil is excessively dry

17. PLOTWET Plot wetness. A code indicating the degree of wetness where most of the bioindicator species are growing. Very dry or exposed sites may mitigate the response of bioindicator species to ambient ozone exposures. This attribute is used for western FIA regions.

<b>Code</b>	<b>Plot wetness</b>
1	Wet or damp (riparian zones, damp areas along a stream or meadow)
2	Moderately dry (grassland, meadow, or east-facing slopes)
3	Very dry (exposed rocky ledges, desert, and some alpine areas)

18. PLTDSTRB Plot disturbance. A code indicating the presence and kind of disturbance where most of the bioindicator species are growing. The response of bioindicator species to ambient ozone exposures is optimized on sites with no recent or significant disturbance. The area affected by any human-caused or natural disturbance must be clearly visible and recent enough to influence plant health and condition. Disturbance that results in significant soil compaction may mitigate the response of bioindicator species to ambient ozone exposures and is considered especially significant. Crews are trained to replace biosites that have been disturbed.

<b>Code</b>	<b>Plot disturbance</b>
0	No recent or significant disturbance
1	Evidence of overuse; human activity causing obvious soil compaction or erosion
2	Evidence of natural disturbance including fire, wind, flooding, grazing, pests, etc.

19. BIOSITE\_INDEX\_MULTIPLIER

Biosite index multiplier. The biosite index multiplier is the biosite index (BIOSITE\_INDEX) multiplied by 1000 to allow the ozone risk categories to be defined by integers. Use this value in reports rather than the calculated biosite index.

$$\text{BIOSITE\_INDEX\_MULTIPLIER} = \text{BIOSITE\_INDEX} * (1000)$$

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 within +/- 8.5

miles of the actual latitude and longitude, and the attribute is in the correct county.

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 within +/- 8.5 miles of the actual latitude and longitude, and the attribute is in the correct county.
22. CREATED\_BY Created by. See OZONE\_PLOT.CREATED\_BY description for definition.
23. CREATED\_DATE Created date. See OZONE\_PLOT.CREATED\_DATE description for definition.
24. CREATED\_IN\_INSTANCE Created in instance. See OZONE\_PLOT.CREATED\_IN\_INSTANCE description for definition.
25. MODIFIED\_BY Modified by. See OZONE\_PLOT.MODIFIED\_BY description for definition.
26. MODIFIED\_DATE Modified date. See OZONE\_PLOT.MODIFIED\_DATE description for definition.
27. MODIFIED\_IN\_INSTANCE Modified in instance. See OZONE\_PLOT.MODIFIED\_IN\_INSTANCE description for definition.

## **Ozone Species Summary Table (Oracle table name is OZONE\_SPECIES\_SUMMARY)**

The attributes in this table summarize ozone injury and site characteristics for each bioindicator species (BIOSPCD) evaluated at each ground location. Ground location differs from ozone biosite because a small number of ozone biosites consist of two ground locations. Ozone biosites that consist of two locations are referred to as split plots. Two locations are used to increase species and plant counts for a single ozone biosite. If two locations are used, they are within 3 miles of each other. The field identification number (FIELD\_ID) is the same for both locations, but they have different split plot identification (SPLIT\_PLOTID) numbers. O3PLOT is a concatenation of FIELD\_ID and SPLIT\_PLOTID and can be used in combination with STATECD, COUNTYCD, and INVYR to uniquely identify each ground location. When two locations are used, the same species (BIOSPCD) may be evaluated at both locations.

Each plant evaluated by the field crews is rated for amount (AMNT) and severity (SVRTY) of ozone injury. The maximum (AMNT\_MAX, SVRTY\_MAX), minimum (AMNT\_MIN, SVRTY\_MIN), and mean (AMNT\_MEAN, SVRTY\_MEAN) values for these two indices are summarized by species (BIOSPCD). Injury amount is an estimate of the percent injured leaves on each plant. Injury severity is an estimate of the mean severity of symptoms on injured foliage. Both attributes should be considered. Some plants may have slight to moderate injury on all leaves; others may have severe injury on a small number of leaves. The injury pattern may be species specific or may relate to the stage of development at the time of ozone exposure. Injury may also depend on site characteristics (e.g., soil depth, size of opening) that have a greater or lesser influence on amount and severity of injury depending on the species. However, the degree to which site characteristics influence injury amount and severity may also be species dependent. Site characteristics presented by species (BIOSPCD) at each ground location include plot size (PLTSIZE), elevation (ELEV), aspect (ASPECT), terrain position (TERRPOS), soil depth (SOILDPTH), soil drainage (SOILDRN), plot wetness (PLOTWET), and plot disturbance (PLTDSTRB).

A species-level ozone injury index (BIOSPCD\_INDEX) is also presented. This provides an opportunity to make comparisons among biosites using indices derived from the same species. A species-specific analysis may be appropriate for certain studies. However, for the purpose of many monitoring reports, the preferred summary statistic is the biosite-level ozone injury index (OZONE\_BIOSITE\_SUMMARY.BIOSITE\_INDEX).

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	INVYR	Inventory year	NUMBER(4)
3	STATECD	State code	NUMBER(4)
4	COUNTYCD	County code	NUMBER(3)
5	O3PLOT	Ozone plot	NUMBER
6	FIELD_ID	Field identification number	NUMBER(7)
7	SPLIT_PLOTID	Split plot identification	NUMBER(1)
8	GROUND_LOC_CD	Ground location code	NUMBER(1)
9	MEASYEAR	Measurement year	NUMBER(4)
10	BIOSPCD	Bioindicator species code	NUMBER
11	AMNT_MAX	Amount maximum	NUMBER
12	AMNT_MIN	Amount minimum	NUMBER
13	AMNT_MEAN	Amount mean	NUMBER
14	SVRTY_MAX	Severity maximum	NUMBER
15	SVRTY_MIN	Severity minimum	NUMBER
16	SVRTY_MEAN	Severity mean	NUMBER
17	PLANT_INJ_CNT	Plant injury count	NUMBER
18	PLANT_EVAL_CNT	Plant evaluation count	NUMBER
19	PLANT_RATIO	Plant ratio	NUMBER
20	BIOSPCD_SUM	Bioindicator species sum	NUMBER
21	BIOSPCD_INDEX	Bioindicator species index	NUMBER
22	ELEV	Elevation	NUMBER(5)
23	PLTSIZE	Plot size	NUMBER
24	ASPECT	Aspect	NUMBER(3)
25	TERRPOS	Terrain position	NUMBER
26	SOILDPTH	Soil depth	NUMBER
27	SOILDRN	Soil drainage	NUMBER
28	PLOTWET	Plot wetness	NUMBER
29	PLTDSTRB	Plot disturbance	NUMBER
30	CREATED_BY	Created by	VARCHAR2(30)
31	CREATED_DATE	Created date	DATE
32	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
33	MODIFIED_BY	Modified by	VARCHAR2(30)
34	MODIFIED_DATE	Modified date	DATE
35	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	OSY_PK
Unique	STATECD, INVYR, COUNTYCD, O3PLOT, BIOSPCD	N/A	OSY_UK

1. CN                      Sequence number. A unique sequence number used to identify an ozone species summary record.
  
2. INVYR                 Inventory year. The year in which ozone data were collected. All the plots in the ozone grid are measured every year.
  
3. STATECD             State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
  
4. COUNTYCD            County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)
  
5. O3PLOT                Ozone plot. A unique identifier for an ozone biosite that is a concatenation of FIELD\_ID and SPLIT\_PLOTID. It can be used in combination with STATECD, COUNTYCD, and INVYR to identify an ozone biomonitoring site. When a biosite is split, O3PLOT is the same for both locations except for the last digit, which will be a 1 or 2.
  
6. FIELD\_ID             Field identification number. A system-generated number used to identify a biosite. There will be more than one record with a given FIELD\_ID value when two locations are sampled for one biosite.
  
7. SPLIT\_PLOTID        Split plot identification. A number used to identify the distinct locations sampled for a particular biosite. SPLIT\_PLOTID = 1 identifies either a single location biosite or the first location of a biosite split between two locations. SPLIT\_PLOTID = 2 identifies the second location of a biosite split between two locations. The second location is added by the field crew to increase species and plant counts for a biosite.

## 8. GROUND\_LOC\_CD

Ground location code. A code indicating the number of times the biosite location has been moved more than 3 miles. The first ground location will be coded GROUND\_LOC\_CD = 1.

Whenever an ozone biosite location moves to more than 3 miles from the initial location, GROUND\_LOC\_CD is increased (i.e., incremented) by 1.

9. MEASYEAR Measurement year. The year in which the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.
10. BIOSPCD Bioindicator species code. A code indicating the bioindicator species on the biosite. Bioindicator species may be a tree, a woody shrub, or a non-woody herb species. All of the species selected for use respond to ambient levels of ozone pollution with distinct visible foliar symptoms that are easy to diagnose. See code list with OZONE\_VALIDATION.BIOSPCD.
11. AMNT\_MAX Amount maximum. The maximum amount of injury for a given bioindicator species (BIOSPCD) at an ozone plot equals the maximum value of all the injury amounts for that species. If there are no injured plants within the species, the maximum amount of injury for the species equals zero.  $AMNT\_MAX = \text{maximum (injury amounts for a given species at an ozone plot)}$
12. AMNT\_MIN Amount minimum. The minimum amount of injury for a given bioindicator species (BIOSPCD) at an ozone plot equals the minimum value of all the injury amounts for that species. If there are no injured plants within the species, the minimum amount of injury for the species equals zero.  $AMNT\_MIN = \text{minimum (injury amounts for a given species at an ozone plot)}$
13. AMNT\_MEAN Amount mean. The mean amount of injury for a given bioindicator species (BIOSPCD) at an ozone plot equals the arithmetic mean of all the injury amounts greater than zero. If there are no injured plants within the species, the mean amount of injury for the species equals zero.  $AMNT\_MEAN = \text{summation (injury amounts for a given species at an ozone plot that are greater than zero) / number of injured plants}$
14. SVRTY\_MAX Severity maximum. The maximum amount of injury severity for a given bioindicator species (BIOSPCD) at an ozone plot equals the maximum value of all the injury severity amounts for that species. If there are no injured plants within the species, the maximum amount of injury severity for the species equals zero.

SVRTY\_MAX = maximum (injury severity amounts for a given species at an ozone plot)

15. SVRTY\_MIN Severity minimum. The minimum amount of injury severity for a given bioindicator species (BIOSPCD) at an ozone plot equals the minimum value of all the injury severity amounts for that species. If there are no injured plants within the species, the minimum amount of injury severity for the species equals zero.  
SVRTY\_MIN = minimum (injury severity amounts for a given species at an ozone plot)

16. SVRTY\_MEAN

Severity mean. The mean amount of injury severity for a given bioindicator species (BIOSPCD) at an ozone plot equals the arithmetic mean of all the injury severity amounts greater than zero. If there are no damaged plants (injury severity amount is null) within the species, the mean amount of injury severity for the species equals zero. SVRTY\_MEAN = summation (injury severity amounts for a given species at an ozone plot that are greater than zero) / number of injured plants

17. PLANT\_INJ\_CNT

Plant injury count. The number of injured plants for a given bioindicator species (BIOSPCD) at an ozone plot equals the number of plants that have injury amounts greater than zero.  
PLANT\_INJ\_CNT = count (plants within a given species at an ozone plot that have an injury amount greater than zero)

18. PLANT\_EVAL\_CNT

Plant evaluation count. The number of plants evaluated equals the total number of plants examined for a given bioindicator species (BIOSPCD) at an ozone plot. PLANT\_EVAL\_CNT = count (all plants evaluated for a given species at an ozone plot)

19. PLANT\_RATIO

Plant ratio. The plant ratio is the ratio of the number of plants injured to the number of plants evaluated for a given bioindicator species (BIOSPCD) at an ozone plot. That is, the plant ratio equals the number of plants injured divided by the number of plants evaluated. PLANT\_RATIO = PLANT\_INJ\_CNT / PLANT\_EVAL\_CNT

## 20. BIOSPCD\_SUM

Bioindicator species sum. The biospecies sum for a given bioindicator species at an ozone plot equals the sum of the products of the plants' injury amount and injury severity values divided by the number of plants injured. If there are no injured plants within the species, the species sum equals zero.  
$$\text{BIOSPCD\_SUM} = \text{summation} ( ( \text{plant's injury amount} ) * ( \text{plant's injury severity} ) ) / \text{PLANT\_INJ\_CNT}$$

## 21. BIOSPCD\_INDEX

Bioindicator species index. The biospecies index for a given bioindicator species at an ozone plot equals the product of the plant ratio and the biospecies sum. This species-level ozone injury index (BIOSPCD\_INDEX) provides an opportunity to make comparisons among plots or regions using an injury index derived from the same species or group of species. A species-specific analysis may be appropriate for certain evaluation monitoring studies.  
$$\text{BIOSPCD\_INDEX} = \text{PLANT\_RATIO} * \text{BIOSPCD\_SUM}$$

## 22. ELEV

Elevation. Elevation data are obtained from USGS topographic maps, generally the 7½ minute series quadrangle. Field crews locate the area where most of the bioindicator species are growing and record elevation to the nearest foot. If available, a global positioning system (GPS) unit is used to determine the plot elevation.

## 23. PLTSIZE

Plot size. A code indicating the size of the opening used for biomonitoring. Open areas that are more than 3 acres in size are ideal because they optimize ozone air mixture. Crews are trained to replace sites that are overgrown. For data from 2002 to the present, the PLTSIZE codes are

<b>Code</b>	<b>Plot size</b>
1	Greater than three acres
2	Greater than one acre, but less than three acres

For data prior to 2002, the PLTSIZE codes are

<b>Code</b>	<b>Plot size</b>
1	Greater than three acres
2	One half to three acres
3	Less than half an acre
4	Under forest canopy; no opening

## 24. ASPECT

Aspect. The aspect attribute identifies the direction of slope for land surfaces with at least 5 percent slope as measured with a hand

compass to the nearest degree (0° to 360°). The majority of plots in eastern regions have no aspect whereas conditions in western regions are more variable. There are no published reports that suggest the direction of slope has a significant bearing on the ozone indicator. However, in western regions, north- or east-facing slopes indicate drier plot moisture conditions than south- or west-facing slopes, and plot moisture can have a significant influence on plant response to ozone.

25. TERRPOS Terrain position. A code indicating the position of the biosite in relation to the surrounding topography. Eastern biosites are often located on flat land. In the West, the terrain may be more varied.

<b>Code</b>	<b>Terrain position</b>
1	Ridge top or upper slope
2	Bench or level area along a slope
3	Lower slope
4	Flat land unrelated to slope
5	Bottom land with occasional flooding

26. SOILDPTH Soil depth. A code indicating the general depth of the soil where most of the bioindicator species are growing. Soil that is generally shallow may be subject to more frequent and severe drought, thereby mitigating the response of bioindicator species to ambient ozone exposures.

<b>Code</b>	<b>Soil depth</b>
1	Bedrock not exposed
2	Bedrock exposed; soil is generally shallow

27. SOILDRN Soil drainage. A code indicating the general soil drainage conditions where most of the bioindicator species are growing. The response of bioindicator species to ambient ozone exposures is optimized on soils that are well drained. This attribute is used for eastern FIA regions.

<b>Code</b>	<b>Soil drainage</b>
1	Soil well drained
2	Soil generally wet
3	Soil excessively dry

28. PLOTWET Plot wetness. A code indicating the degree of wetness where most of the bioindicator species are growing. Very dry or exposed sites may mitigate the response of bioindicator species to ambient ozone exposures. This attribute is used for western FIA regions.

<b>Code</b>	<b>Plot wetness</b>
1	Plot is wet; riparian zone or bottomland
2	Plot is moderately dry; meadow or northeast-facing slope
3	Plot is very dry; exposed ledge, desert or alpine area

29. **PLTDSTRB** Plot disturbance. A code indicating the presence and kind of disturbance where most of the bioindicator species are growing. The response of bioindicator species to ambient ozone exposures is optimized on sites with no recent or significant disturbance. The area affected by any human-caused or natural disturbance must be clearly visible and recent enough to influence plant health and condition. Disturbance that results in significant soil compaction may mitigate the response of bioindicator species to ambient ozone exposures and is considered especially significant. Crews are trained to replace biosites that have been disturbed.

<b>Code</b>	<b>Plot disturbance</b>
0	No recent or significant disturbance
1	Evidence of overuse; human activity causing obvious soil compaction or erosion
2	Evidence of natural disturbance including fire, wind, flooding, grazing, pests, etc.

30. **CREATED\_BY**

Created by. See OZONE\_PLOT.CREATED\_BY description for definition.

31. **CREATED\_DATE**

Created date. See OZONE\_PLOT.CREATED\_DATE description for definition.

32. **CREATED\_IN\_INSTANCE**

Created in instance. See OZONE\_PLOT.CREATED\_IN\_INSTANCE description for definition.

33. **MODIFIED\_BY**

Modified by. See OZONE\_PLOT.MODIFIED\_BY description for definition.

34. **MODIFIED\_DATE**

Modified date. See OZONE\_PLOT.MODIFIED\_DATE description for definition.

35. **MODIFIED\_IN\_INSTANCE**

Modified in instance. See OZONE\_PLOT.MODIFIED\_IN\_INSTANCE description for definition.

**Lichen Visit Table (Oracle table name is LICHEN\_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	LICHEN_STATCD	Lichen status code	NUMBER(2)
11	LIPROJCD	Lichen project code	NUMBER(2)
12	SMPLSTRT	Sample start time	NUMBER(4)
13	SMPLSTP	Sample stop time	NUMBER(4)
14	SMPLTIME	Sample time	NUMBER(4)
15	SFTWDPCT	Softwood percent (percent conifers)	NUMBER(3)
16	HRDWPCT	Hardwood percent	NUMBER(3)
17	SHRUBPCT	Shrub percent	NUMBER(3)
18	GAPPCT	Gap percent	NUMBER(3)
19	GAPRCNT	Gap recent	NUMBER(2)
20	TALLSHRB	Tall shrubs	NUMBER(2)
21	FTRCD1	Feature code 1	NUMBER
22	FTRCD2	Feature code 2	NUMBER
23	FTRCD3	Feature code 3	NUMBER
24	FTRCD4	Feature code 4	NUMBER
25	ISSUECD1	Issue code 1	NUMBER
26	ISSUECD2	Issue code 2	NUMBER
27	ISSUECD3	Issue code 3	NUMBER
28	ISSUECD4	Issue code 4	NUMBER
29	SZCLSCD1	Size class code 1	NUMBER(2)
30	SZCLSCD2	Size class code 2	NUMBER(2)
31	SZCLSCD3	Size class code 3	NUMBER(2)
32	CREATED_BY	Created by	VARCHAR2(30)
33	CREATED_DATE	Created date	DATE
34	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
35	MODIFIED_BY	Modified by	VARCHAR2(30)

Column Name	Descriptive Name	Oracle data type
36 MODIFIED_DATE	Modified date	DATE
37 MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	LVT_PK
Unique	PLT_CN	N/A	LVT_UK
Natural	STATECD, INVYR, PLOT, COUNTYCD	N/A	LVT_NAT_I
Foreign	PLT_CN	LICHEN_VISIT to PLOT	LVT_PLT_FK

1. CN                      Sequence number. A unique sequence number used to identify a lichen visit record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the lichen visit record to the plot record.
  
3. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.
  
4. STATECD              State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

- 5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 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 lichen plot was surveyed to provide the data presented.
- 8. MEASMON Measurement month. The month in which the lichen plot was surveyed to provide the data presented.
- 9. MEASYEAR Measurement year. The year in which the lichen plot was surveyed to provide the data presented. MEASYEAR may differ from INVYR.

10. LICHEN\_STATCD

Lichen status code. A code indicating whether or not lichens were collected and, if not collected, why not.

<b>Code</b>	<b>Lichen status</b>
1	Lichens collected
2	Plot searched, no lichens found
3	Not collected – no measurements taken - plot harvested
4	Not collected – no measurements taken – plot dangerous
5	Not collected – ran out of time
6	Not collected – rain/storm
7	Not collected – left plot for emergency
8	Lichens not scheduled for collection on the plot
9	Not collected for other reason

- 11. LIPROJCD Lichen project code. A code indicating the type of lichen project for which these data are collected.

<b>Code</b>	<b>Lichen project</b>
1	Standard production plot
2	Special study
3	Gradient study
4	Evaluation Monitoring

12. SMPLSTRT Sample start time. The time lichen sampling began entered as HHMM, where HH is hour and MM is minutes. Military time is used (e.g., 1:45 pm is 1345).
13. SMPLSTP Sample stop time. The time lichen sampling ended entered as HHMM, where HH is hour and MM is minutes. Military time is used (e.g., 1:45 pm is 1345).
14. SMPLTIME Sample time. The total time used for sampling calculated as SMPLSTP minus SMPLSTRT, reported as HHMM, where HH is hour and MM is minutes (e.g., 0145 is total elapsed time of 1 hour and 45 minutes).
15. SFTWDPCT Softwood percent (percent conifer). Percent canopy cover of the lichen plot in overstory conifers (not of lichens) estimated (not measured) in 5-percent classes.
16. HRDWDPCT Hardwood percent. Percent canopy cover of the lichen plot in overstory hardwoods (not of lichens) estimated (not measured) in 5-percent classes.
17. SHRUBPCT Shrub percent. Percent of the lichen plot with shrubs estimated (not measured) in 5-percent classes.
18. GAPPCT Gap percent. Percent gap recorded in 5-percent classes. To be a gap, there must be markedly different terrestrial vegetation than on forest floor; lack of trees on at least 3 to 5 percent of plot; and canopy opening whose length or width is at least one tree length. Note: gaps are caused by disturbance, not just low density of tree establishment.
19. GAPRCNT Gap recent. A code indicating whether or not the gap appeared to be less than 5 years old (e.g., caused by recent disturbance).
- | <b>Code</b> | <b>Gap recent</b> |
|-------------|-------------------|
| 0           | ≥ 5 yr old        |
| 1           | < 5 yr old        |
20. TALLSHRB Tall shrubs. A code indicating whether or not the gap had > 40 percent cover of tall shrubs (i.e., > 3.3 ft (1 m) tall). Broadleaf shrubs in gaps of conifer forest are often especially rich areas for lichen diversity.
- | <b>Code</b> | <b>Tall shrubs</b>  |
|-------------|---------------------|
| 0           | No tall shrubs      |
| 1           | Tall shrubs present |

21. FTRCD1 Feature code 1. A code indicating important plot features such as substrate species or conditions that had the most impact on lichen diversity of the plot (e.g., recently clearcut, riparian with large hardwoods, old growth). If any FTRCDx = 00, no other values will be retained.

<b>Code</b>	<b>Feature</b>
00	No significant features

High Diversity:

01	Stand appears relatively old for its forest type
02	Old remnant trees in otherwise young stand
03	Riparian
04	Gap in forest
05	Moist areas on plot with open structure and high light
06	Abundance of tall shrubs hosting high lichen diversity
07	Hardwoods within conifer forest had high diversity and/or different species
08	Conifers within hardwood forest had high diversity and/or different species
09	Presence of exceptionally good lichen substrate species (differs by region)
10	Other

Low Diversity:

11	Very young forest or recently regenerating clearcut
12	Clearcut
13	Recently burned – lichens apparently removed by fire
14	Too dry for good lichen growth
15	Too exposed or open for good lichen growth
16	Some of plot nonforest
17	Most of trees on plot were poor lichen substrates (differs by region)
18	Most of the diversity was on a few trees or less
19	Other

22. FTRCD2 Feature code 2. A code indicating important plot features such as substrate species or conditions that had the most impact on lichen diversity of the plot (e.g., recently clearcut, riparian with large hardwoods, old growth). If any FTRCDx = 00, no other values will be retained. See FTRCD1 for codes.

23. FTRCD3 Feature code 3. A code indicating important plot features such as substrate species or conditions that had the most impact on lichen diversity of the plot (e.g., recently clearcut, riparian with large hardwoods, old growth). If any FTRCDx = 00, no other values will be retained. See FTRCD1 for codes.

24. FTRCD4 Feature code 4. A code indicating important plot features such as substrate species or conditions that had the most impact on lichen

diversity of the plot (e.g., recently clearcut, riparian with large hardwoods, old growth). If any FTRCDx = 00, no other values will be retained. See FTRCD1 for codes.

25. ISSUECD1 Issue code 1. A code indicating a major problem that negatively impacted the collection effort. If any ISSUECDx = 0, no other values will be retained.

Code	Issue
0	No significant issues
1	Too wet to see lichens well
2	Too dark to see lichens well
3	Sampling compromised by heat
4	Sampling compromised by other extreme weather (e.g., hail, lightning, snow)
5	Very steep slope hindered thorough plot access
6	Access to some or all of plot blocked by natural obstacles (e.g., lingering snowpack, high water, landslide, large blowdowns)
7	Other

26. ISSUECD2 Issue code 2. A code indicating a major problem that negatively impacted the collection effort. If any ISSUECDx = 0, no other values will be retained. See ISSUECD1 for codes.

27. ISSUECD3 Issue code 3. A code indicating a major problem that negatively impacted the collection effort. If any ISSUECDx = 0, no other values will be retained. See ISSUECD1 for codes.

28. ISSUECD4 Issue code 4. A code indicating a major problem that negatively impacted the collection effort. If any ISSUECDx = 0, no other values will be retained. See ISSUECD1 for codes.

29. SZCLSCD1 Size class code 1. A code indicating the size class of the first of the three largest trees on the entire lichen plot.

Code	Size class (d.b.h., inches)
1	< 10
2	10-20
3	21-30
4	31-40
5	> 40

30. SZCLSCD2 Size class code 2. A code indicating the size class of the second of the three largest trees on the entire lichen plot. See SZCLSCD1 for codes.

31. SZCLSCD3 Size class code 3. A code indicating the size class of the third of the three largest trees on the entire lichen plot. See SZCLSCD1 for codes.

32. CREATED\_BY

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

33. CREATED\_DATE

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

34. 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.

35. MODIFIED\_BY

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

36. MODIFIED\_DATE

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

37. MODIFIED\_IN\_INSTANCE

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

## Lichen Lab Table (Oracle table name is LICHEN\_LAB)

	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	LICH_SPPCD	Lichen species code	NUMBER(5)
8	MEASYEAR	Measurement year	NUMBER(4)
9	ABUNDANCE_CLASS	Abundance class	NUMBER(4)
10	ORIGIN_FLAG	Origin flag	NUMBER(1)
11	SPP_COMMENTS	Species comments	VARCHAR2(2000)
12	CREATED_BY	Created by	VARCHAR2(30)
13	CREATED_DATE	Created date	DATE
14	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
15	MODIFIED_BY	Modified by	VARCHAR2(30)
16	MODIFIED_DATE	Modified date	DATE
17	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	LCH_PK
Unique	PLT_CN, LICH_SPPCD	N/A	LCH_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, LICH_SPPCD	N/A	LCH_NAT_I
Foreign	PLT_CN	LICHEN_LAB to PLOT	LCH_PLT_FK

1. CN                      Sequence number. A unique sequence number used to identify a lichen lab record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the lichen lab record to the plot record.
  
3. 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 those western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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. LICH\_SPPCD  
  
Lichen species code. A numeric code used for a particular lichen taxon. To determine which species the code represents, this code should be linked with either the SPP\_ACRONYM or a unique combination of GENUS and SPECIES in table REF\_LICHEN\_SPECIES.
8. MEASYEAR Measurement year. The year in which the lichen plot samples were collected to provide the data presented. MEASYEAR may differ from INVYR.

## 9. ABUNDANCE\_CLASS

Abundance class. A code indicating the abundance class assigned to LICH\_SPPCD in this sample. Abundance class is assigned in the field according to the following scheme:

Code	Abundance
1	Rare (1-3 individuals in area)
2	Uncommon (4-10 individuals in area)
3	Common (> 10 individuals in area but less than half of the boles and branches have that species present)
4	Abundant (more than half of boles and branches have the subject species present). Note: this code is not frequently assigned, but is valid. Make sure that more than one out of every 2 boles, branches, and twigs host this species.

Abundance class is modified in the lab if the taxon is represented by two or more field collections, according to the following scheme:

Recorded values	Final abundance
1 + 1 . . . . .	2
1 + 1 + 1 + 1 + 1 . . . . .	2
More than five 1s. . . . .	3
1 + 2 . . . . .	2
2 + 2 . . . . .	2
1 + 1 + 2 . . . . .	2
1 + 1 + 1 + 2 . . . . .	3
1 + 2 + 2 . . . . .	3
3 + any others . . . . .	3
4 + any others . . . . .	4
0 + 1 . . . . .	3
0 + 2 . . . . .	3
0 + 3 . . . . .	3
0 + 4 . . . . .	4
0 (any number of 0s with no other values) . . . . .	0.01

Any sample with no assigned field abundance is assigned a lab abundance code of 0. If this species has no other abundance code >0, the lab enters the code 0.01. When data are uploaded to the FIA database, a default abundance code of 3 is entered into the database for a species with abundance code 0.01. When ORIGIN\_FLAG is fully implemented, this code will signal that ORIGIN\_FLAG is to be set to an as yet unassigned value for non-field origin of the abundance code.

## 10. ORIGIN\_FLAG

Origin flag. Flag denoting whether abundance class was assigned based on field designation (ORIGIN\_FLAG value = 1) or was

assigned a value in the lab because no abundance class was assigned in the field (ORIGIN\_FLAG value as yet unassigned). Currently all records are assigned origin value = 1 when loaded, regardless of ABUNDANCE\_CLASS value at loading. Currently not implemented.

11. SPP\_COMMENTS

Species comments. Comments about this species on this plot by the lichen identification specialist. For instance 'cf' in the comment field means the identification was tentative. For a species identified only to genus, this field might list some morphological characters. Currently not populated.

12. CREATED\_BY

Created by. See LICHEN\_VISIT.CREATED\_BY description for definition.

13. CREATED\_DATE

Created date. See LICHEN\_VISIT.CREATED\_DATE description for definition.

14. CREATED\_IN\_INSTANCE

Created in instance. See LICHEN\_VISIT.CREATED\_IN\_INSTANCE description for definition.

15. MODIFIED\_BY

Modified by. See LICHEN\_VISIT.MODIFIED\_BY description for definition.

16. MODIFIED\_DATE

Modified date. See LICHEN\_VISIT.MODIFIED\_DATE description for definition.

17. MODIFIED\_IN\_INSTANCE

Modified in instance. See LICHEN\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Lichen Plot Summary Table (Oracle table name is LICHEN\_PLOT\_SUMMARY)**

	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	MEASYEAR	Measurement year	NUMBER(4)
8	SUMMATION	Summation	NUMBER(7,4)
9	RICHNESS	Richness	NUMBER(2)
10	EVENNESS	Evenness	NUMBER(5,4)
11	DIVERSITY	Diversity	NUMBER(5,4)
12	CREATED_BY	Created by	VARCHAR2(30)
13	CREATED_DATE	Created date	DATE
14	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
15	MODIFIED_BY	Modified by	VARCHAR2(30)
16	MODIFIED_DATE	Modified date	DATE
17	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	LPS_PK
Unique	PLT_CN	N/A	LPS_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT	N/A	LPS_NAT_I
Foreign	PLT_CN	LICHEN_PLOT_SUMMARY to PLOT	LPS_PLT_FK

1. CN                      Sequence number. A unique sequence number used to identify a lichen plot summary record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the lichen plot summary record to the plot record.
  
3. 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 those western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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. MEASYEAR Measurement year. The year in which the lichen plot samples were collected to provide the data summarized. MEASYEAR may differ from INVYR.
8. SUMMATION Summation. Sum of abundance values for all lichen species on plot. Abundance values are 1 = 1-3 individuals; 2 = 4-10 individuals; 3 = >10 individuals but on less than half the available substrates (boles, branches, shrubs, saplings, snags); 4 = species found on more than half the available substrates.
9. RICHNESS Richness. The number of lichen species on a plot. Lichens identified only to genus are included in this count; a lichen listed by genus only is known to be different from any other species found on the plot.
10. EVENNESS Evenness. Evenness of species abundance. A measure of how evenly abundance is distributed among species, calculated as  $(\text{DIVERSITY} = H') / \ln(\text{RICHNESS})$ .

11. DIVERSITY    Diversity. Diversity is the Shannon-Wiener Diversity Index:  
$$H' = - \sum (P_i * \ln(P_i))$$
 for all species 1 to i on a plot  
where  $P_i$  is the proportion of total abundance for species i on that plot.  $P_i = (\text{ABUNDANCE for species } i \text{ on that plot}) / \text{SUMMATION}$ .
12. CREATED\_BY  
Created by. See LICHEN\_VISIT.CREATED\_BY description for definition.
13. CREATED\_DATE  
Created date. See LICHEN\_VISIT.CREATED\_DATE description for definition.
14. CREATED\_IN\_INSTANCE  
Created in instance. See LICHEN\_VISIT.CREATED\_IN\_INSTANCE description for definition.
15. MODIFIED\_BY  
Modified by. See LICHEN\_VISIT.MODIFIED\_BY description for definition.
16. MODIFIED\_DATE  
Modified date. See LICHEN\_VISIT.MODIFIED\_DATE description for definition.
17. MODIFIED\_IN\_INSTANCE  
Modified in instance. See LICHEN\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Lichen Species Summary Table (Oracle table name is LICHEN\_SPECIES\_SUMMARY)**

Column Name	Descriptive Name	Oracle data type
1 CN	Sequence number	VARCHAR2(34)
2 INVYR	Inventory year	NUMBER(4)
3 LICHEN_REGION	Lichen region	NUMBER(4)
4 LICH_SPPCD	Lichen species code	NUMBER(5)
5 MEASYEAR	Measurement year	NUMBER(4)
6 LICHEN_REGION_DESCR	Lichen region description	VARCHAR2(80)
7 SPP_ACRONYM	Species acronym	VARCHAR2(6)
8 GENUS	Genus	VARCHAR2(40)
9 SUM_ABUNDANCE	Sum of abundance	NUMBER(7,4)
10 FREQUENCY_PCT	Frequency percent	NUMBER(3)
11 SPECIES	Species	VARCHAR2(50)
12 PLOTS_IN_REGION	Plots in region (number)	NUMBER(4)
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	LSY_PK
Unique	INVYR, LICHEN_REGION, LICH_SPPCD	N/A	LSY_UK

1. CN                      Sequence number. A unique sequence number used to identify a lichen species summary 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 those western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

3. LICHEN\_REGION

Lichen region. A code indicating the lichen region (see table below). The numerical code for the FIA region or subregion across which lichen species distribution is summarized; boundaries usually coincide with state boundaries. This region is not the same as a lichen gradient model.

Code	Region name	Included States
1	Northeastern	STATECD = 9, 23, 25, 33, 36, 44, 50
2	Southeastern	STATECD = 1, 12, 13, 21, 37, 45, 47, 51
3	Interior West	STATECD = 4, 8, 16, 30, 32, 35, 49, 56
4	West Coast	STATECD = 2, 6, 15, 41, 53
5	Mid-South	STATECD = 5, 22, 28, 40, 48
6	Mid-Atlantic	STATECD = 10, 24, 34, 39, 42, 54
7	North Central	STATECD = 17, 18, 19, 20, 26, 27, 29, 31, 38, 46, 55

4. LICH\_SPPCD Lichen species code. A numeric code used for a particular lichen taxon. To determine which species the code represents, this code should be linked with either the SPP\_ACRONYM or a unique combination of GENUS and SPECIES in table REF\_LICHEN\_SPECIES.

5. MEASYEAR Measurement year. The year in which the lichen plot samples were collected to provide the data summarized. MEASYEAR may differ from INVYR.

6. LICHEN\_REGION\_DESCR

Lichen region description. The name (see table above) for the FIA region or subregion for which data are summarized (e.g., Northeastern, Mid-Atlantic, Southeastern).

7. SPP\_ACRONYM

Species acronym. Three- to six-letter acronym for lichen species. See Table REF\_LICHEN\_SPECIES for a complete list of numerical codes, species acronyms, and species names used in the

program, and see table REF\_LICHEN\_SPP\_COMMENTS for a history of taxonomic usage in the program.

8. GENUS            Genus. The lichen genus name. See table REF\_LICHEN\_SPECIES for a complete list of numerical codes, species acronyms, and species names used in the program, and see table REF\_LICHEN\_SPP\_COMMENTS for a history of taxonomic usage in the program.
  
9. SUM\_ABUNDANCE  
  
Sum of abundance. Sum of abundance values on all plots in the region. Abundance values are 1 = 1-3 individuals; 2 = 4-10 individuals; 3 = >10 individuals but on less than half the available substrates (boles, branches, shrubs, saplings, snags); 4 = species found on more than half the available substrates.
  
10. FREQUENCY\_PCT  
  
Frequency percent. Percent of searched plots in region with species present. This is calculated as  $100 * (\# \text{ plots with species present}) / \text{PLOTS\_IN\_REGION}$ . Note that plots searched and found to have no lichens are counted for the denominator.
  
11. SPECIES        Species. The lichen species epithet (second part of Latin scientific specific name). May include subspecies, variety, or form if needed. A complete list of numerical codes, species acronyms, and species names used in the FIA program can be found in the table REF\_LICHEN\_SPECIES. See table REF\_LICHEN\_SPP\_COMMENTS for a history of taxonomic usage in the FIA Program.
  
12. PLOTS\_IN\_REGION  
  
Plots in region. Number of plots in LICHEN\_REGION searched for lichens. This is the number of plots searched for lichens in the region being summarized. Plots searched and found to have no lichens are included in this count. Plots not searched for lichens, for any reason, are not included in this count.
  
13. CREATED\_BY  
  
Created by. See LICHEN\_VISIT.CREATED\_BY description for definition.

14. CREATED\_DATE

Created by. See LICHEN\_VISIT.CREATED\_DATE description for definition.

15. CREATED\_IN\_INSTANCE

Created in instance. See LICHEN\_VISIT.CREATED\_IN\_INSTANCE description for definition.

16. MODIFIED\_BY

Modified by. See LICHEN\_VISIT.MODIFIED\_BY description for definition.

17. MODIFIED\_DATE

Modified date. See LICHEN\_VISIT.MODIFIED\_DATE description for definition.

18. MODIFIED\_IN\_INSTANCE

Modified in instance. See LICHEN\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Lichen Species Reference Table (Oracle table name is REF\_LICHEN\_SPECIES)**

Column Name	Descriptive Name	Oracle data type
1 LICH_SPPCD	Lichen species code	NUMBER(5)
2 YEARSTART	Year start	NUMBER(4)
3 YEAREND	Year end	NUMBER(4)
4 SPP_ACRONYM	Species acronym	VARCHAR2(6)
5 GENUS	Genus	VARCHAR2(40)
6 SPECIES	Species	VARCHAR2(50)
7 CN	Sequence number	VARCHAR2(34)
8 CREATED_BY	Created by	VARCHAR2(30)
9 CREATED_DATE	Created date	DATE
10 CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
11 MODIFIED_BY	Modified by	VARCHAR2(30)
12 MODIFIED_DATE	Modified date	DATE
13 MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s)	Tables to link	Abbreviated notation
Primary	CN	N/A	LNS_PK
Unique	LICH_SPPCD, SPP_ACRONYM, GENUS, YEARSTART	N/A	LNS_UK

1. **LICH\_SPPCD** Lichen species code. A unique numerical code for each lichen species name used in the program. Only one particular combination of LICH\_SPPCD and SPP\_ACRONYM with a GENUS and SPECIES is in use in the program at any one time. A taxon is tracked through time with LICH\_SPPCD and SPP\_ACRONYM; GENUS and SPECIES may change without interfering with tracking the taxon through time. LICH\_SPPCD links this table with table REF\_LICHEN\_SPP\_COMMENTS that includes important notes about taxonomic usage and documents changes in taxonomic usage in the program.
2. **YEARSTART** Year start. The year a particular combination of LICH\_SPPCD, SPP\_ACRONYM, GENUS, and SPECIES was put into use. Default start year for most species is 1993. LICHEN\_LAB entries with MEASYEAR = YEARSTART use that particular combination of LICH\_SPPCD, SPP\_ACRONYM, GENUS, and SPECIES as needed.
3. **YEAREND** Year end. The year a particular combination of LICH\_SPPCD, SPP\_ACRONYM, GENUS, and SPECIES was retired from use.

LICHEN\_LAB entries with MEASYEAR = YEAREND do not use that particular combination of LICH\_SPPCD, SPP\_ACRONYM, GENUS, and SPECIES. Records in this table with YEAREND not null should be deleted before matching this table with any LICHEN\_LAB table.

#### 4. SPP\_ACRONYM

Species acronym. A unique three- to six-letter acronym for each lichen species used in the program. Only one particular combination of LICH\_SPPCD and SPP\_ACRONYM with a GENUS and SPECIES is in use in the program at any one time. A taxon is tracked through time with LICH\_SPPCD and SPP\_ACRONYM; GENUS and SPECIES may change without interfering with tracking the taxon through time. See table REF\_LICHEN\_SPP\_COMMENTS for a history of taxonomic usage in the program.

#### 5. GENUS

Genus. The lichen genus name. Only one particular combination of LICH\_SPPCD, SPP\_ACRONYM, GENUS, and SPECIES is in use in the program at any one time. A taxon is tracked through time with LICH\_SPPCD and SPP\_ACRONYM; GENUS and SPECIES may change without interfering with tracking the taxon through time. See table REF\_LICHEN\_SPP\_COMMENTS for a history of taxonomic usage in the program.

#### 6. SPECIES

Species. The lichen species name (including subspecies, variety, or form if needed). Only one particular combination of LICH\_SPPCD, SPP\_ACRONYM, GENUS, and SPECIES is in use in the program at any one time. A taxon is tracked through time with LICH\_SPPCD and SPP\_ACRONYM; GENUS and SPECIES may change without interfering with tracking the taxon through time. See table REF\_LICHEN\_SPP\_COMMENTS for a history of taxonomic usage in the program.

#### 7. CN

Sequence number. A unique sequence number used to identify a lichen reference lichen species record.

#### 8. CREATED\_BY

Created by. See LICHEN\_VISIT.CREATED\_BY description for definition.

#### 9. CREATED\_DATE

Created date. See LICHEN\_VISIT.CREATED\_DATE description for definition.

10. CREATED\_IN\_INSTANCE

Created in instance. See LICHEN\_VISIT.CREATED\_IN\_INSTANCE description for definition.

11. MODIFIED\_BY

Modified by. See LICHEN\_VISIT.MODIFIED\_BY description for definition.

12. MODIFIED\_DATE

Modified date. See LICHEN\_VISIT.MODIFIED\_DATE description for definition.

13. MODIFIED\_IN\_INSTANCE

Modified in instance. See LICHEN\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Lichen Species Comments Table (Oracle table name is REF\_LICHEN\_SPP\_COMMENTS)**

	Column Name	Descriptive Name	Oracle data type
1	LICH_SPPCD	Lichen species code	NUMBER(5)
2	SPP_NAME	Species name	VARCHAR2(80)
3	YEAREND	Year end	NUMBER(4)
4	YEARSTART	Year start	NUMBER(4)
5	SPP_COMMENTS	Species comments	VARCHAR2(2000)
6	CN	Sequence number	VARCHAR2(34)
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)	Tables to link	Abbreviated notation
Primary	CN	N/A	LCM_PK
Unique	LICH_SPPCD, SPP_NAME, YEARSTART	N/A	LCM_UK

1. LICH\_SPPCD Lichen species code. A unique numerical code for each lichen species name used in the program. Only one particular combination of LICH\_SPPCD and REF\_LICHEN\_SPECIES.SPP\_ACRONYM with a REF\_LICHEN\_SPECIES.GENUS and REF\_LICHEN\_SPECIES.SPECIES is in use in the program at any one time. A taxon is tracked through time with LICH\_SPPCD and REF\_LICHEN\_SPECIES.SPP\_ACRONYM; GENUS and SPECIES may change without interfering with tracking the taxon through time. LICH\_SPPCD links this table with table REF\_LICHEN\_SPECIES, a master list of all species codes and names used in the program.
2. SPP\_NAME Species name. This field includes the full species name corresponding to LICH\_SPPCD; it includes both REF\_LICHEN\_SPECIES.GENUS and REF\_LICHEN\_SPECIES.SPECIES. Only one particular combination of LICH\_SPPCD and REF\_LICHEN\_SPECIES.SPP\_ACRONYM with a REF\_LICHEN\_SPECIES.GENUS and

REF\_LICHEN\_SPECIES.SPECIES is in use in the program at any one time.

3. YEAREND Year end. The year a particular combination of LICH\_SPPCD, REF\_LICHEN\_SPECIES.SPP\_ACRONYM, REF\_LICHEN\_SPECIES.GENUS, and REF\_LICHEN\_SPECIES.SPECIES (the latter two represented in this table by SPP\_NAME) was retired from use. LICHEN\_LAB entries with MEASYEAR = YEAREND do not use that particular combination of LICH\_SPPCD, REF\_LICHEN\_SPECIES.SPP\_ACRONYM, REF\_LICHEN\_SPECIES.GENUS, and REF\_LICHEN\_SPECIES.SPECIES.
4. YEARSTART Year start. The year a particular combination of LICH\_SPPCD, REF\_LICHEN\_SPECIES.SPP\_ACRONYM, REF\_LICHEN\_SPECIES.GENUS, and REF\_LICHEN\_SPECIES.SPECIES (the latter two represented in this table by SPP\_NAME) was put into use. Default start year for most species is 1993. LICHEN\_LAB entries with MEASYEAR = YEARSTART use that particular combination of LICH\_SPPCD, REF\_LICHEN\_SPECIES.SPP\_ACRONYM, REF\_LICHEN\_SPECIES.GENUS, and REF\_LICHEN\_SPECIES.SPECIES as needed.
5. SPP\_COMMENTS

Species comments. This field includes informational comments, explanations of changes in taxonomic usage between years, and actions to perform before analyzing data. For most changes (even those with action code 0 = no action), there are individual records for each unique combination of LICH\_SPPCD, REF\_LICHEN\_SPECIES.SPP\_ACRONYM, REF\_LICHEN\_SPECIES.GENUS, and REF\_LICHEN\_SPECIES.SPECIES (the latter two represented in this table by SPP\_NAME) involved in the change and/or action. FIA does not use thin layer chromatography (TLC) or examinations of thin sections for identification of lichen specimens. Lichen species whose identification requires these techniques are so noted; they are then grouped under the name of a look-alike species identifiable from morphology visible with a dissecting microscope, chemical spot tests, and/or examination with a long-wave UV (ultraviolet) lamp. Simple corrections to spelling of genus or species name are not represented by comments in this file, although they are recorded by REF\_LICHEN\_SPECIES.YEARSTART and REF\_LICHEN\_SPECIES.YEAREND. If data from a single

LICHEN\_LAB.MEASYEAR are to be analyzed, action codes 1 and 2 apply, action codes 3 and 4 do not apply, and action codes 5, 6, and 7 should be checked to see if parts apply. If data from both the East and West are to be combined for analysis, the analyst should consult the Lichens Indicator Advisor for advice on how to reconcile actions between regions, for all taxa with action code 5 listed.

Action codes:

0 = no action  
1 = exclude for most analysis  
2 = always combine  
3 = 'crossing [YEAR]' conditional combine  
4 = subset before or after [YEAR] conditional combine  
5 = region conditional combine  
6 = unique complicated combination of actions 1-5  
7 = complicated action not definable as a combination of other action codes.

For year conditional combines, the phrase 'crossing [YEAR]' should be interpreted as 'data with MEASYEAR=[YEAR] and/or later, compared to data with MEASYEAR=[YEAR]-1 and/or earlier.' The phrase 'before [YEAR]' means data with MEASYEAR=[YEAR]-1 and/or earlier; 'after [YEAR]' means data with MEASYEAR=[YEAR]+1 and/or later.

For action codes 5 and 6, other action codes for specific regions or years are listed after that code. If a region conditional action is one of the actions under action code 6, action code 5 is listed just before action codes 0-4 for within a region.

Region definitions:

East = Northern (N) and Southern (S) FIA Regions  
West = Interior West (IW) and Pacific Northwest (PNW) FIA Regions

For any action (codes 2, 3, 4) that involves combining two or more taxa by LICH\_SPPCD and REF\_LICHEN\_SPECIES.SPP\_ACRONYM, if more than one of these LICH\_SPPCD or REF\_LICHEN\_SPECIES.SPP\_ACRONYM occur on a single plot, then field abundances (LICHEN\_LAB.ABUNDANCE\_CLASS) for the original taxa must be combined by the following rules to become the abundance for the 'combined into' LICH\_SPPCD and REF\_LICHEN\_SPECIES.SPP\_ACRONYM on that plot:

<b>Abundances for individual taxa</b>	<b>Abundance for final combined taxon</b>
1 + 1	2
1 + 1 + 1 + 1 + 1	2
More than five 1s	3
1 + 2	2
2 + 2	2
1 + 1 + 2	2
1 + 1 + 1 + 2	3
1 + 2 + 2	3
3 + any others	3
4 + any others	4

6. CN Sequence number. A unique sequence number used to identify a lichen species comments record.

7. CREATED\_BY

Created by. See LICHEN\_VISIT.CREATED\_BY description for definition.

8. CREATED\_DATE

Created date. See LICHEN\_VISIT.CREATED\_DATE description for definition.

9. CREATED\_IN\_INSTANCE

Created in instance. See LICHEN\_VISIT.CREATED\_IN\_INSTANCE description for definition.

10. MODIFIED\_BY

Modified by. See LICHEN\_VISIT.MODIFIED\_BY description for definition.

11. MODIFIED\_DATE

Modified date. See LICHEN\_VISIT.MODIFIED\_DATE description for definition.

12. MODIFIED\_IN\_INSTANCE

Modified in instance. See LICHEN\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Soils Visit Table (Oracle table name is SOILS\_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	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	SVT_PK
Unique	PLT_CN	N/A	SVT_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT	N/A	SVT_NAT_I
Foreign	PLT_CN	SOILS_VISIT to PLOT	SVT_PLT_FK

1. CN                      Sequence number. A unique sequence number used to identify a soils visit record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the soils visit record to the P2 plot record.
  
3. 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 those western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

- 4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 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 of the month on which the plot was completed.
- 8. MEASMON Measurement month. The month on which the plot was completed.
 

Code	Month	Code	Month
01	January	07	July
02	February	08	August
03	March	09	September
04	April	10	October
05	May	11	November
06	June	12	December
- 9. MEASYEAR Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
- 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 on which 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 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 on which the record was last modified. This field will be 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 null if the data have not been modified since initial creation

### Soils Erosion Table (Oracle table name is SOILS\_EROSION)

	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
8	MEASYEAR	Measurement year	NUMBER(4)
9	SOILSPCT	Soils percent (percent bare soil)	NUMBER
10	COMPCPCT	Compact percent (percent compacted area)	NUMBER
11	TYPRTDCD	Type rutted trail code	NUMBER
12	TYPCMPCD	Type compacted trail code	NUMBER
13	TYPAREACD	Type compacted area code	NUMBER
14	TYPOTHRCD	Type other code	NUMBER
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)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	SEN_PK
Unique	PLT_CN, SUBP	N/A	SEN_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP	N/A	SEN_NAT_I

1. CN                      Sequence number. A unique sequence number used to identify a soils erosion record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the soils erosion record to the P2 plot record.
  
3. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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. SUBP Subplot number. Number of the subplot. Annual inventories have subplot number values of 1 through 4. Subplot numbers of periodic inventories will vary. For more information, contact the appropriate FIA unit.
8. MEASYEAR Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
9. SOILSPCT Soils percent (percent bare soil). Indicates the percentage of the subplot that is covered by bare soil (mineral or organic). Fine gravel [0.08-0.20 inch (2-5 mm)] is considered part of the bare soil. However, large rocks protruding through the soil (e.g., bedrock outcrops) are not included in this category because these

are not erodible surfaces. For the soil indicator, cryptobiotic crusts are not considered bare soil.

If the subplot includes non-forested areas, the percent cover of bare soil in the forested part of the subplot is multiplied by the percent of the subplot that is in forested area. For example, if 50 percent of the subplot is forested and the percent cover of bare soil of the forested part is 30 percent, then the percent cover of bare soil for the entire subplot is 15 percent.

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

10. **COMPCPCT** Compacted percent (percent compacted area). Indicates the percentage of the subplot that exhibits evidence of compaction. Soil compaction is assessed relative to the conditions of adjacent undisturbed soil. Improved roads are not included in the evaluation.

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

11. **TYPRTDCD** Type rutted trail code. A code indicating the type of compaction that is a rutted trail. Ruts must be at least 2 inches deep into mineral soil or 6 inches deep from the undisturbed forest litter surface.

Code	Type rutted trail
1	Present
0	Not present

12. **TYPMPCD** Type compacted trail code. A code indicating the type of compaction that is a compacted trail (usually the result of many passes of heavy machinery, vehicles, or large animals).

<b>Code</b>	<b>Type compacted trail</b>
1	Present
0	Not present

13. **TYPAREACD** Type compacted area code. A code indicating the type of compaction that is a compacted area. Examples include the junction areas of skid trails, landing areas, work areas, animal bedding areas, heavily grazed areas, etc.

<b>Code</b>	<b>Type compacted area</b>
1	Present
0	Not present

14. **TYPOTHRCD** Type other code. A code indicating the type of compaction that is some other form. An explanation must be entered in the plot notes.

<b>Code</b>	<b>Type other compaction</b>
1	Present
0	Not present

15. **CREATED\_BY**

Created by. See SOILS\_VISIT.CREATED\_BY description for definition.

16. **CREATED\_DATE**

Created date. See SOILS\_VISIT.CREATED\_DATE description for definition.

17. **CREATED\_IN\_INSTANCE**

Created in instance. See SOILS\_VISIT.CREATED\_IN\_INSTANCE description for definition.

18. **MODIFIED\_BY**

Modified by. See SOILS\_VISIT.MODIFIED\_BY description for definition.

19. **MODIFIED\_DATE**

Modified date. See SOILS\_VISIT.MODIFIED\_DATE description for definition.

## 20. MODIFIED\_IN\_INSTANCE

Modified in instance. See SOILS\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

### Soils Sample Location Table (Oracle table name is SOILS\_SAMPLE\_LOC)

	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	SMPLNNBR	Sample line number	NUMBER(1)
8	MEASYEAR	Measurement year	NUMBER(4)
9	FORFLTHK	Average forest floor thickness for the subplot	NUMBER
10	LTRLRTHK	Average litter layer thickness for the subplot	NUMBER
11	FORFLTHKN	Forest floor thickness north (at the north edge of the sampling frame)	NUMBER
12	LTRLRTHKN	Litter layer thickness north (at the north edge of the sampling frame)	NUMBER
13	FORFLTHKS	Forest floor thickness south (at the south edge of the sampling frame)	NUMBER
14	LTRLRTHKS	Litter layer thickness south (at the south edge of the sampling frame)	NUMBER
15	FORFLTHKE	Forest floor thickness east (at the east edge of the sampling frame)	NUMBER
16	LTRLRTHKE	Litter layer thickness east (at the east edge of the sampling frame)	NUMBER
17	FORFLTHKW	Forest floor thickness west (at the west edge of the sampling frame)	NUMBER
18	LTRLRTHKW	Litter layer thickness west (at the west edge of the sampling frame)	NUMBER
19	CONDID	Condition class number	NUMBER(1)
20	VSTNBR	Visit number	NUMBER(1)
21	TXTRLR1	Texture layer 1	NUMBER
22	TXTRLR2	Texture layer 2	NUMBER
23	DPTHBSL	Depth to a restricted layer	NUMBER
24	SOILS_STATCD	Soil sampling status code	NUMBER(2)
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	SSL_PK
Unique	PLT_CN, SMPLNNBR	N/A	SSL_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SMPLNNBR	N/A	SSL_NAT_I

1. CN                      Sequence number. A unique sequence number used to identify a soils sample location record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the soils sample location record to the P2 plot record.
  
3. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

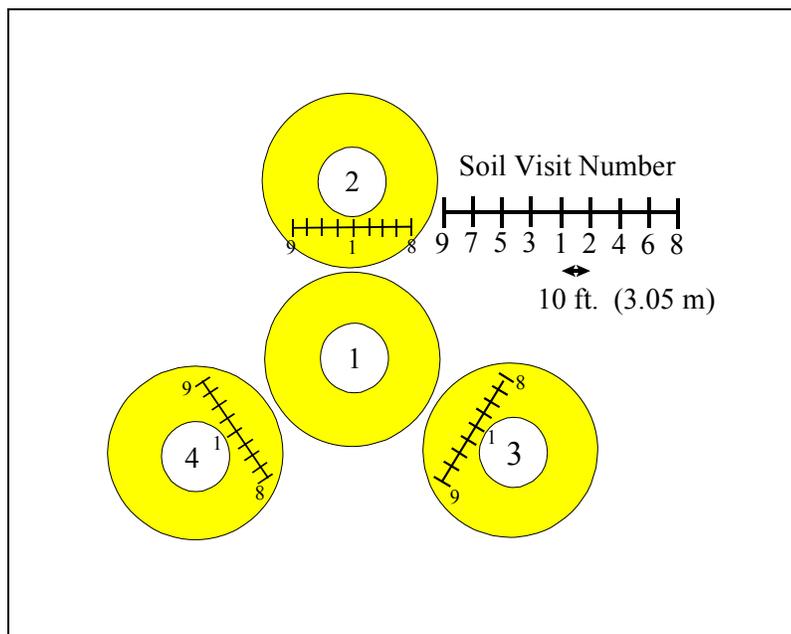
4. STATECD              State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
  
5. COUNTYCD            County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

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. SMPLNNBR Sample line number. The number corresponding to the subplot where the sample was collected. SMPLNNBR equals the subplot number (SUBP). Values are 2, 3, 4.
8. MEASYEAR Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
9. FORFLTHK Average forest floor thickness for the subplot. Recorded in inches.  $FORFLTHK = (FORFLTHKE + FORFLTHKW + FORFLTHKN + FORFLTHKS) / 4$
10. LTRLRTHK Average litter layer thickness for the subplot. Recorded in inches.  $LTRLRTHK = (LTRLRTHKE + LTRLRTHKW + LTRLRTHKN + LTRLRTHKS) / 4$
11. FORFLTHKN Forest floor thickness north (at the north edge of the sampling frame). The thickness (to the nearest 0.1 inch) of the forest floor measured from the top of the litter layer to the boundary between the forest floor and mineral soil; measured to a maximum depth of 20.0 inches. If the thickness of the forest floor is greater than 20.0 inches, then the code 20.0 is used. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.
12. LTRLRTHKN Litter layer thickness north (at the north edge of the sampling frame). The thickness of the litter layer (to the nearest 0.1 inch) at the north location within the sampling frame. The bottom of the litter layer can be distinguished as the boundary where plant parts (such as leaves or needles) are no longer recognizable as such because of decomposition. Another criterion is that the organic layer may contain plant roots, but the litter layer will probably not. At some locations, the depth of the forest floor and the litter layer may be the same. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.
13. FORFLTHKS Forest floor thickness south (at the south edge of the sampling frame). The thickness (to the nearest 0.1 inch) of the forest floor measured from the top of the litter layer to the boundary between the forest floor and mineral soil; measured to a maximum depth of 20.0 inches. If the thickness of the forest floor is greater than 20.0 inches, then the code 20.0 is used. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.
14. LTRLRTHKS Litter layer thickness south (at the south edge of the sampling frame). The thickness of the litter layer (to the nearest 0.1 inch) at

the south location within the sampling frame. The bottom of the litter layer can be distinguished as the boundary where plant parts (such as leaves or needles) are no longer recognizable as such because of decomposition. Another criterion is that the organic layer may contain plant roots, but the litter layer will probably not. At some locations, the depth of the forest floor and the depth of the litter layer may be the same. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.

15. FORFLTHKE Forest floor thickness east (at the east edge of the sampling frame). The thickness (to the nearest 0.1 inch) of the forest floor measured from the top of the litter layer to the boundary between the forest floor and mineral soil; measured to a maximum depth of 20.0 inches. If the thickness of the forest floor is greater than 20.0 inches, then the code 20.0 is used. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.
16. LTRLRTHKE Litter layer thickness east (at the east edge of the sampling frame). The thickness of the litter layer (to the nearest 0.1 inch) at the east location within the sampling frame. The bottom of the litter layer can be distinguished as the boundary where plant parts (such as leaves or needles) are no longer recognizable as such because of decomposition. Another criterion is that the organic layer may contain plant roots, but the litter layer will probably not. At some locations, the depth of the forest floor and the depth of the litter layer may be the same. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.
17. FORFLTHKW Forest floor thickness west (at the west edge of the sampling frame). The thickness (to the nearest 0.1 inch) of the forest floor measured from the top of the litter layer to the boundary between the forest floor and mineral soil; measured to a maximum depth of 20.0 inches. If the thickness of the forest floor is greater than 20.0 inches, then the code 20.0 is used. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.
18. LTRLRTHKW Litter layer thickness west (at the west edge of the sampling frame). The thickness of the litter layer (to the nearest 0.1 inch) at the west location within the sampling frame. The bottom of the litter layer can be distinguished as the boundary where plant parts (such as leaves or needles) are no longer recognizable as such because of decomposition. Another criterion is that the organic layer may contain plant roots, but the litter layer will probably not. At some locations, the depth of the forest floor and the depth of the litter layer may be the same. For locations where bare soil or bedrock material is exposed, 00.0 inches depth is entered.

19. **CONDID** Condition class number. Unique identifying number assigned to each condition on a plot. This attribute is blank (null) if no soils sample was taken (nonsampled). 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.
20. **VSTNBR** Visit number. The number of the soil sampling location at which the soil sample was collected. Values are 1 – 9.



Location of soil sampling site. Figure 11-1 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/>)

21. TXTRL1YR1 Texture layer 1. A code indicating the soil texture of the 0-4 inch layer estimated in the field.

Code	Texture
0	Organic
1	Loamy
2	Clayey
3	Sandy
4	Coarse sand
9	Not measured – make plot notes

22. TXTRL2YR2 Texture layer 2. A code indicating the soil texture of the 4-8 inch layer estimated in the field.

Code	Texture
0	Organic
1	Loamy
2	Clayey
3	Sandy
4	Coarse sand
9	Not measured – make plot notes

23. DPTHBSL Depth to a restricted layer. Indicates the median depth of five locations within the soil sampling area (center, north, east, south, and west edges) to a restrictive layer (to the nearest 0.1 inch). The maximum depth for testing for a restrictive horizon is 20.0 inches. If a restrictive layer is encountered within the 20.0 inches, the median depth (to the nearest 0.1 inch) to the restrictive horizon of the five locations probed is recorded. Other possible values are

20.0 if a restrictive horizon is not encountered  
 00.0 if superficial bedrock is present  
 999 if too many rock fragments or cobbles prevent inserting soil probe

24. SOILS\_STATCD

Soil sampling status. A code indicating whether or not a forest floor or mineral soil sample was collected at the soil sampling location. For both forest floor and mineral samples, it is the condition of the soil sampling sites in the annular plot that determines whether soil samples are collected. Samples are collected if, and only if, the soil sampling site is in a forested condition (regardless of the condition class of the subplot). For example, in cases where the subplot has at least one forested condition class and the soil sampling site is not in a forested condition class, soil samples are not collected. Similarly, in cases where the soil sampling site is in a forested condition class and the

subplot does not have at least one forested condition class, soil samples are collected.

**Code    Soil sampling status**

1        Sampled  
2        Not sampled: nonforest

The following are for forest conditions:

3        Not sampled: too rocky to sample  
4        Not sampled: water or boggy  
5        Not sampled: access denied  
6        Not sampled: too dangerous to sample  
7        Not sampled: obstruction in sampling area  
8        Not sampled: broken or lost equipment  
9        Not sampled: other - enter reason in plot notes  
11       Sampled: forest that has not been identified as a condition on the plot

25. **CREATED\_BY**

Created by. See SOILS\_VISIT.CREATED\_BY description for definition.

26. **CREATED\_DATE**

Created date. See SOILS\_VISIT.CREATED\_DATE description for definition.

27. **CREATED\_IN\_INSTANCE**

Created in instance. See SOILS\_VISIT.CREATED\_IN\_INSTANCE description for definition.

28. **MODIFIED\_BY**

Modified by. See SOILS\_VISIT.MODIFIED\_BY description for definition.

29. **MODIFIED\_DATE**

Modified date. See SOILS\_VISIT.MODIFIED\_DATE description for definition.

30. **MODIFIED\_IN\_INSTANCE**

Modified in instance. See SOILS\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Soils Lab Table (Oracle table name is SOILS\_LAB)**

	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	SMPLNNBR	Sample line number	NUMBER(3)
8	VSTNBR	Visit number	NUMBER(1)
9	LAYER_TYPE	Layer type	VARCHAR2(10)
10	SAMPLER_TYPE	Sampler type	VARCHAR2(2)
11	QASTATCD	Quality assurance status code	NUMBER(1)
12	SAMPLE_DATE	Sample date	DATE
13	LAB_ID	Laboratory identification	VARCHAR2(10)
14	SAMPLE_ID	Sample identification	VARCHAR2(12)
15	FIELD_MOIST_SOIL_WT	Field moist soil weight	NUMBER(7,2)
16	AIR_DRY_SOIL_WT	Air-dry soil weight	NUMBER(7,2)
17	OVEN_DRY_SOIL_WT	Ovendry soil weight	NUMBER(7,2)
18	FIELD_MOIST_WATER_CONTENT_PCT	Field moist water content percent	NUMBER(6,2)
19	RESIDUAL_WATER_CONTENT_PCT	Residual water content percent	NUMBER(6,2)
20	TOTAL_WATER_CONTENT_PCT	Total water content in percent	NUMBER(6,2)
21	BULK_DENSITY	Bulk density	NUMBER(7,3)
22	COARSE_FRACTION_PCT	Coarse fraction percent	NUMBER(7,3)
23	C_ORG_PCT	Carbon organic percent	NUMBER(7,3)
24	C_INORG_PCT	Carbon inorganic percent	NUMBER(7,3)
25	C_TOTAL_PCT	Carbon total percent	NUMBER(7,3)
26	N_TOTAL_PCT	Nitrogen total percent	NUMBER(7,3)
27	PH_H2O	pH measured in water	NUMBER(7,3)
28	PH_CACL2	pH measured in calcium chloride	NUMBER(7,3)
29	EXCHNG_NA	Exchangeable sodium	NUMBER(8,3)
30	EXCHNG_K	Exchangeable potassium	NUMBER(7,3)
31	EXCHNG_MG	Exchangeable magnesium	NUMBER(8,3)
32	EXCHNG_CA	Exchangeable calcium	NUMBER(8,3)
33	EXCHNG_AL	Exchangeable aluminum	NUMBER(7,3)
34	ECEC	Effective cation exchange capacity	NUMBER(7,3)
35	EXCHNG_MN	Exchangeable manganese	NUMBER(7,3)
36	EXCHNG_FE	Exchangeable iron	NUMBER(7,3)

Column Name	Descriptive Name	Oracle data type
37 EXCHNG_NI	Exchangeable nickel	NUMBER(7,3)
38 EXCHNG_CU	Exchangeable copper	NUMBER(7,3)
39 EXCHNG_ZN	Exchangeable zinc	NUMBER(7,3)
40 EXCHNG_CD	Exchangeable cadmium	NUMBER(7,3)
41 EXCHNG_PB	Exchangeable lead	NUMBER(7,3)
42 EXCHNG_S	Exchangeable sulfur	NUMBER(8,3)
43 BRAY1_P	Bray 1 phosphorus	NUMBER(7,3)
44 OLSEN_P	Olsen phosphorus	NUMBER(7,3)
45 MEASYEAR	Measurement year	NUMBER(4)
46 MODIFIED_BY	Modified by	VARCHAR2(30)
47 MODIFIED_DATE	Modified date	DATE
48 MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)
49 CREATED_BY	Created by	VARCHAR2(30)
50 CREATED_DATE	Created date	DATE
51 CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	SLB_PK
Unique	PLT_CN, SMPLNNBR, LAYER_TYPE	N/A	SLB_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SMPLNNBR, LAYER_TYPE	N/A	SLB_NAT_I

1. CN                      Sequence number. A unique sequence number used to identify a soils lab record.
  
2. PLT\_CN                Plot sequence number. Foreign key linking the soils lab record to the P2 plot record.
  
3. 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.

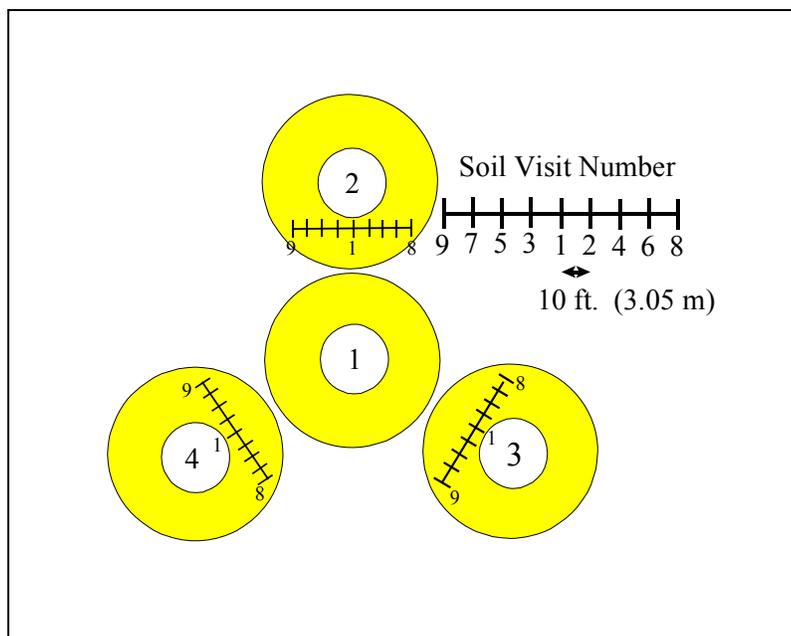
**Exceptions:**

INVYR = 9999. INVYR is set to 9999 to distinguish those Western P3 plots that are “off subpanel” because of differences in

measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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. SMPLNNBR Sample line number. The number corresponding to the subplot where the sample was collected. SMPLNNBR equals the subplot number (SUBP). Values are 2, 3, 4.

8. VSTNBR Visit number. The number of the soil sampling location at which the soil sample was collected. Values are 1 - 9.



Location of soil sampling site. Figure 11-1 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/>)

9. LAYER\_TYPE

Layer type. Indicates the soil layer type.

Code	Layer type
FF_TOTAL	Total forest floor: litter + humus (duff)
L_ORG	Organic soil litter layer
MIN_1	0-4 inch mineral soil layer
MIN_2	4-8 inch mineral soil layer
ORG_1	0-4 inch organic soil layer
ORG_2	4-8 inch organic soil layer

10. SAMPLER\_TYPE

Sampler type. A code indicating the type of soil sampler used.

Code	Sampler type
SF	Sample frame
BD	Bulk density sampler
O	Other

11. QASTATCD Quality assurance status. A code indicating the type of plot data collected. Populated for all forested subplots using the National Field Guide protocols (MANUAL  $\geq$  1.0).

<b>Code</b>	<b>Quality assurance status</b>
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)

12. SAMPLE\_DATE

Sample date. Indicates the date of soil measurements and sampling.

13. LAB\_ID

Laboratory identification. Indicates the laboratory where the analyses were done.

14. SAMPLE\_ID

Sample identification. Internal lab sample identification number used to identify samples, match to plot identifier data, and track samples.

15. FIELD\_MOIST\_SOIL\_WT

Field moist soil weight. The weight of the soil sample as received from the field in grams.

16. AIR\_DRY\_SOIL\_WT

Air-dry soil weight. The weight of the soil sample after air-drying at ambient temperature in grams.

17. OVEN\_DRY\_SOIL\_WT

Oven-dry soil weight. The calculated weight of the soil sample based on an oven-dried subsample in grams.

18. FIELD\_MOIST\_WATER\_CONTENT\_PCT

Field moist water content percent. The field-moist to air-dry water content in percent.

19. RESIDUAL\_WATER\_CONTENT\_PCT

Residual water content percent. The air-dry to oven-dry water content in percent.

20. TOTAL\_WATER\_CONTENT\_PCT

Total water content in percent. The field-moist to air-dry + air-dry to oven-dry water contents in percent.

21. BULK\_DENSITY

Bulk density. The soil bulk density calculated as weight per unit volume of soil, g/cm<sup>3</sup>.

22. COARSE\_FRACTION\_PCT

Coarse fraction percent. The percentage of mineral soil greater than 2 mm in size.

23. C\_ORG\_PCT Carbon organic percent. Organic carbon in percent.

24. C\_INORG\_PCT

Carbon inorganic percent. Inorganic carbon (carbonates) in percent.

25. C\_TOTAL\_PCT

Carbon total percent. Total carbon (organic + inorganic) in percent.

26. N\_TOTAL\_PCT

Nitrogen total percent. Total nitrogen in percent.

27. PH\_H2O pH in water. Soil pH in a 1:1 soil/water suspension.

28. PH\_CACL2 pH in calcium chloride. Soil pH in 0.01 M CaCl<sub>2</sub> solution.

29. EXCHNG\_NA Exchangeable sodium in mg/kg.

30. EXCHNG\_K Exchangeable potassium in mg/kg.

31. EXCHNG\_MG Exchangeable magnesium in mg/kg.

32. EXCHNG\_CA Exchangeable calcium in mg/kg.

33. EXCHNG\_AL Exchangeable aluminum in mg/kg.

34. ECEC Effective cation exchange capacity. Exchangeable Na + K + Mg + Ca + Al) in cmol<sub>c</sub>/kg.

35. EXCHNG\_MN Exchangeable manganese in mg/kg.

36. EXCHNG\_FE Exchangeable iron in mg/kg.

37. EXCHNG\_NI Exchangeable nickel in mg/kg.

38. EXCHNG\_CU Exchangeable copper in mg/kg.

39. EXCHNG\_ZN Exchangeable zinc in mg/kg.
40. EXCHNG\_CD Exchangeable cadmium in mg/kg.
41. EXCHNG\_PB Exchangeable lead in mg/kg.
42. EXCHNG\_S Exchangeable sulfur in mg/kg.
43. BRAY1\_P Bray 1 phosphorus. Bray 1 extractable phosphorus in mg/kg.
44. OLSEN\_P Olsen phosphorus. Olsen extractable phosphorus in mg/kg.
45. MEASYEAR Measurement year. The year in which the plot was completed. MEASYEAR may differ from INVYR.
46. MODIFIED\_BY  
Modified by. See SOILS\_VISIT.MODIFIED\_BY description for definition.
47. MODIFIED\_DATE  
Modified date. See SOILS\_VISIT.MODIFIED\_DATE description for definition.
48. MODIFIED\_IN\_INSTANCE  
Modified in instance. See SOILS\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.
49. CREATED\_BY  
Created by. See SOILS\_VISIT.CREATED\_BY description for definition.
50. CREATED\_DATE  
Created date. See SOILS\_VISIT.CREATED\_DATE description for definition.
51. CREATED\_IN\_INSTANCE  
Created in instance. See SOILS\_VISIT.CREATED\_IN\_INSTANCE description for definition.

### Vegetation Visit Table (Oracle table name is VEG\_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	VEG_QA_STATUS	Vegetation quality assurance status	NUMBER(1)
8	VEG_KINDCD	Vegetation sample kind code	NUMBER(2)
9	VEG_MANUAL	Vegetation manual (field guide) version number	VARCHAR2(8)
10	TRACE_COVER_ALLOWED	Trace cover allowed	NUMBER(1)
11	VEG_MEASYEAR	Vegetation measurement year	NUMBER(4)
12	VEG_MEASMON	Vegetation measurement month	NUMBER(2)
13	VEG_MEASDAY	Vegetation measurement day	NUMBER(2)
14	VEG_SAMPLE_BASIS	Vegetation sample basis	NUMBER(1)
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)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	VVT_PK
Unique	PLT_CN	N/A	VVT_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT	N/A	VVT_NAT_I
Foreign	PLT_CN	VEG_VISIT to PLOT	VVT_PLT_FK

1. CN                      Sequence number. A unique sequence number used to identify a vegetation visit record. Other tables will reference this as VVT\_CN (VEG\_VISIT CN).
  
2. PLT\_CN                Plot sequence number. Foreign key linking the vegetation visit record to the P2 plot record (via PLOT.CN).
  
3. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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. VEG\_QA\_STATUS Vegetation quality assurance status. A code indicating the type of vegetation measurement conducted. Production plots have VEG\_QA\_STATUS = 1 or 7.

<b>Code</b>	<b>Vegetation quality assurance status</b>
1	Standard field 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)

## 8. VEG\_KINDCD

Vegetation sample kind code. A code indicating the kind of vegetation plot that was measured.

<b>Code</b>	<b>Vegetation sample kind</b>
1	Initial P3 VEG plot establishment
2	Remeasurement of previously established P3 VEG plot
3	Replacement P3 VEG plot

## 9. VEG\_MANUAL

Vegetation manual (field guide). Field guide version used to collect the P3 Vegetation Diversity and Structure data. Typically, this will be the same as the P2 field guide version, after version 2.0.1.

NOTE: Version 1.7 of the field guide was used in 2001-2003. Version 2.0, first used in 2004, introduced a new protocol with significant changes in the vegetation sample basis. Version 2.0.1 and later versions modify the 2.0 protocol to allow recording of a separate value for plant covers with less than one percent as less than one percent (trace). The primary differences between the 1.7 and 2.0 and later protocols are noted under VEG\_SAMPLE\_BASIS, TRACE\_COVER\_ALLOWED and “\*\_PRE2004” columns.

## 10. TRACE\_COVER\_ALLOWED

Trace cover allowed. A code indicating whether plant cover values of less than one percent were recorded as 1 or 0.01 percent (collected as “t” in the field). The ability to enter trace as 0.01 percent was added starting with VEG\_MANUAL = 2.0.1.

<b>Code</b>	<b>Trace cover allowed</b>
0	Trace cover value (0.01 percent, recorded as “t” in the field) not allowed; trace cover entered as full one percent (VEG_MANUAL = 2.0 and earlier)
1	Trace cover value (0.01 percent, recorded as “t” in the field) allowed for species canopy cover records (VEG_MANUAL = 2.0.1 and later)

## 11. VEG\_MEASYEAR

Vegetation measurement year. Year in which the plot was measured for P3 Vegetation Diversity and Structure data.

12. VEG\_MEASMON

Vegetation measurement month. Month in which the plot was measured for P3 Vegetation Diversity and Structure data.

13. VEG\_MEASDAY

Vegetation measurement day. Day on which the plot was measured for P3 Vegetation Diversity and Structure data.

14. VEG\_SAMPLE\_BASIS

Vegetation sample basis. A code indicating whether P3 Vegetation and Diversity Structure data were collected on both forested and nonforested portions of a subplot with at least 50 percent accessible forest, or on accessible forest conditions only. This code affects how data are compiled to determine (a) the total canopy cover by layer or (b) the cover of a species as a percent of the accessible forested portion of a subplot for those subplots with `VEG_SUBPLOT.SUBP_ACCESSIBLE_FOREST_PCT < 100`.

The effects of VEG\_SAMPLE\_BASIS when adjusting ocular measures of canopy cover on partially forested subplots:

When `VEG_SAMPLE_BASIS = 1`, and `SUBP_ACCESSIBLE_FOREST_PCT` is less than 100, we make the assumption that cover is spread evenly over the entire subplot in order to calculate the total canopy cover in **accessible forest**. To calculate the total canopy cover (in any layer) in accessible forest conditions, multiply total canopy cover recorded by the proportion of subplot in forested condition (`SUBP_ACCESSIBLE_FOREST_PCT/100%`).

When `VEG_SAMPLE_BASIS = 2`, and `SUBP_ACCESSIBLE_FOREST_PCT` is less than 100, calculate total cover on the accessible forested conditions by dividing the recorded total canopy cover (in any layer) by the proportion of subplot in accessible forested condition (`SUBP_ACCESSIBLE_FOREST_PCT/100%`).

Example:

A subplot is 70 percent in accessible forested condition. The proportion of subplot area in forest condition is 0.70. Species A is present on the subplot with a total cover of 10 percent, with half its cover on the non-forested portion of the subplot. If this subplot was measured under `VEG_SAMPLE_BASIS = 1`, cover for species A would have been recorded as 10 percent. Under

VEG\_SAMPLE\_BASIS = 2, species A would be recorded as 5 percent. To determine the percent cover of species A in the forested area of the plot:

VEG\_SAMPLE\_BASIS = 1:

Cover species A in forested area =  $10\% \times 0.7 = 7\%$

VEG\_SAMPLE\_BASIS = 2

Cover species A in forested area =  $5\% \div 0.7 = 7\%$

**Code**   **Vegetation sample basis**

- 1      Data collected across entire subplot where percent accessible forest conditions is greater than or equal to 50 percent (VEG\_MANUAL = 1.7). May include non-forest, hazardous, or access denied conditions.
- 2      Data collected on accessible forest conditions only (VEG\_MANUAL = 2.0 and higher)

15. CREATED\_BY

Created by. See VEG\_VISIT.CREATED\_BY description for definition.

16. CREATED\_DATE

Created date. See VEG\_VISIT.CREATED\_DATE description for definition.

17. CREATED\_IN\_INSTANCE

Created in instance. See VEG\_VISIT.CREATED\_IN\_INSTANCE description for definition.

18. MODIFIED\_BY

Modified by. See VEG\_VISIT.MODIFIED\_BY description for definition.

19. MODIFIED\_DATE

Modified date. See VEG\_VISIT.MODIFIED\_DATE description for definition.

20. MODIFIED\_IN\_INSTANCE

Modified in instance. See VEG\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

## Vegetation Plot Species Table (Oracle table name is VEG\_PLOT\_SPECIES)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	VVT_CN	Vegetation visit sequence number	VARCHAR2(34)
4	INVYR	Inventory year	NUMBER(4)
5	STATECD	State code	NUMBER(4)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER(5)
8	VEG_FLDSPCD	Vegetation field species code	VARCHAR2(16)
9	UNIQUE_SP_NBR	Unique species number	NUMBER(2)
10	VEG_SPCD	Vegetation species code	VARCHAR2(16)
11	SPECIMEN_COLLECTED	Specimen officially collected	CHAR(1)
12	SPECIMEN_LABEL_NBR	Specimen label number	NUMBER
13	SPECIMEN_NOT_COLLECTED_REASON	Specimen not collected reason	NUMBER(2)
14	SPECIMEN_RESOLVED	Specimen resolved	CHAR(1)
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)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	VPS_PK
Unique	PLT_CN, VVT_CN, VEG_FLDSPCD, UNIQUE_SP_NBR	N/A	VPS_UK
	PLT_CN, VVT_CN, CN	N/A	VPS_UK2
Natural	STATECD, INVYR, COUNTYCD, PLOT, VEG_FLDSPCD, UNIQUE_SP_NBR	N/A	VPS_NAT_I

1. CN                      Sequence number. A unique sequence number used to identify a vegetation plot species record. Other tables will reference this as VPS\_CN.
2. PLT\_CN                Plot sequence number. Foreign key linking the vegetation plot species record to the P2 plot record (via PLOT.CN).
3. VVT\_CN                Vegetation visit sequence number. Foreign key linking the vegetation plot species record to the vegetation visit record (via VEG\_VISIT.CN).

4. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.
5. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
6. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
7. PLOT P2 plot number. An identifier for a plot. Along with STATECD, INVYR, and COUNTYCD, PLOT may be used to uniquely identify a plot.
8. VEG\_FLDSPCD Vegetation field species code. Field recorded vegetation species code for each vascular plant species found rooted in or overhanging a subplot. Combined with UNIQUE\_SP\_NBR to identify what was believed in the field to be a unique species on the plot. For VEG\_VISIT.VEG\_MANUAL = 2.0.1 and higher, codes must be the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database January 2010

version to represent species, genus, or unknown plants. Identification to species only is expected. However, if subspecies information is known, the appropriate NRCS code may be entered. This attribute is assigned in the field and never changes. Updates to unknown species codes are recorded in VEG\_SPCD.

For VEG\_VISIT.VEG\_MANUAL = 1.7, the VEG\_FLDSPCD may not be a valid NRCS code for unknown plant species, as these were typically recorded as UN; however, these codes are resolved to valid NRCS codes in VEG\_SPCD.

9. UNIQUE\_SP\_NBR

Unique species number. This code combined with VEG\_FLDSPCD identifies what was believed to be a unique species on the plot. It identifies the number of species recorded for each NRCS genus or unknown code. For example, two unidentifiable *Carex* spp. would be entered as two separate records with VEG\_FLDSPCD = 'CAREX' and differing UNIQUE\_SP\_NBRs to show that they are not the same species. If the VEG\_FLDSPCD entered already identifies a specific species (e.g., PIST for *Pinus strobus*), then UNIQUE\_SP\_NBR = 1.

10. VEG\_SPCD Vegetation species code. Final edited species code, including any resolution of collected unknown plant specimens (e.g., herbarium-resolved species) and conforming to the NRCS PLANTS database as downloaded in January 2010.

11. SPECIMEN\_COLLECTED

Specimen collected. A code indicating whether or not a specimen was collected.

Code	Specimen collected
0	No, a specimen was not collected
1	Yes, a specimen was collected

12. SPECIMEN\_LABEL\_NBR

Specimen label number. For any unknown specimen collected, this is the corresponding specimen label number.

13. SPECIMEN\_NOT\_COLLECTED\_REASON

Specimen not collected reason. A code indicating the reason a specimen was not collected when VEG\_FLDSPCD is an NRCS genus or unknown code and a specimen was not collected.

<b>Code</b>	<b>Reason specimen not collected</b>
01	Species is locally sparse
02	Species has < 1 percent canopy cover on the subplot and no mature foliage or reproductive parts are present
03	Hazardous situation
04	Time limitation
05	Already collected with previous entry of genus or unknown code with the same unique species number
06	Specimen collected for immediate/local identification
10	Other (explain in notes)

#### 14. SPECIMEN\_RESOLVED

Specimen resolved. A derived code indicating the status of unknown or genus specimen that was collected for identification. That is, if VEG\_FLDSPCD is an unknown or genus code, and SPECIMEN\_COLLECTED = 1, SPECIMEN\_RESOLVED must be recorded. If the specimen was identified in the field to the species level and still collected (e.g., for local plant library or training purposes), then VEG\_FLDSPCD will identify the plant to the species level and this variable will be left blank (null); no resolution is required.

<b>Code</b>	<b>Specimen resolved</b>
0	No, specimen not resolved. The unknown specimen (i.e., VEG_FLDSPCD contains an unknown or genus code) has not yet been identified and updated in VEG_SPCD.
1	Yes, specimen resolved. The unknown specimen has been identified and VEG_SPCD has been updated.
Blank (null)	Specimen resolution not required.

#### 15. CREATED\_BY

Created by. See VEG\_VISIT.CREATED\_BY description for definition.

#### 16. CREATED\_DATE

Created date. See VEG\_VISIT.CREATED\_DATE description for definition.

#### 17. CREATED\_IN\_INSTANCE

Created in instance. See VEG\_VISIT.CREATED\_IN\_INSTANCE description for definition.

#### 18. MODIFIED\_BY

Modified by. See VEG\_VISIT.MODIFIED\_BY description for definition.

19. MODIFIED\_DATE

Modified date. See VEG\_VISIT.MODIFIED\_DATE description for definition.

20. MODIFIED\_IN\_INSTANCE

Modified in instance. See VEG\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

## Vegetation Subplot Table (Oracle table name is VEG\_SUBPLOT)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	VVT_CN	Vegetation visit sequence number	VARCHAR2(34)
4	INVYR	Inventory year	NUMBER(4)
5	STATECD	State code	NUMBER(4)
6	COUNTYCD	County code	NUMBER(3)
7	PLOT	Phase 2 plot number	NUMBER(5)
8	SUBP	Subplot number	NUMBER(1)
9	VEG_SUBP_STATUS_CD	Vegetation subplot status code	NUMBER(1)
10	VEG_SUBP_NONSAMPLE_REASN_CD	Vegetation subplot nonsampled reason code	NUMBER(2)
11	SUBP_ACCESSIBLE_FOREST_PCT	Subplot accessible forest percent	NUMBER(3)
12	DETAILED_NONFOREST_LAND_USE	Detailed nonforest land use	NUMBER(2)
13	TOTAL_CANOPY_COVER_LAYER_1	Total canopy cover layer 1	NUMBER(3)
14	TOTAL_CANOPY_COVER_LAYER_2	Total canopy cover layer 2	NUMBER(3)
15	TOTAL_CANOPY_COVER_LAYER_3	Total canopy cover layer 3	NUMBER(3)
16	TOTAL_CANOPY_COVER_LAYER_4	Total canopy cover layer 4	NUMBER(3)
17	CRYPTO_CRUST_COVER_PCT	Cryptobiotic crust cover percent	NUMBER(3)
18	LICHEN_COVER_PCT	Lichen cover percent	NUMBER(3)
19	LITTER_DUFF_COVER_PCT	Litter and duff cover percent	NUMBER(3)
20	MINERAL_SOIL_COVER_PCT	Mineral soil cover percent	NUMBER(3)
21	MOSS_COVER_PCT	Moss cover percent	NUMBER(3)
22	ROAD_TRAIL_COVER_PCT	Road and trail cover percent	NUMBER(3)
23	ROCK_COVER_PCT	Rock cover percent	NUMBER(3)
24	STANDING_WATER_COVER_PCT	Standing water cover percent	NUMBER(3)
25	STREAM_LAKE_COVER_PCT	Stream and lake cover percent	NUMBER(3)
26	TRASH_JUNK_COVER_PCT	Trash and junk cover percent	NUMBER(3)
27	WOOD_COVER_PCT	Wood cover percent	NUMBER(3)
28	VEG_SUBP_STATUS_CD_PRE2004	Vegetation subplot status code, pre2004	NUMBER(1)
29	VEG_SUBP_NONSMP_RSN_CD_PRE2004	Vegetation subplot nonsampled reason code, pre2004	NUMBER(2)
30	CREATED_BY	Created by	VARCHAR2(30)
31	CREATED_DATE	Created date	DATE
32	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
33	MODIFIED_BY	Modified by	VARCHAR2(30)
34	MODIFIED_DATE	Modified date	DATE

Column Name	Descriptive Name	Oracle data type
35 MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	VSB_PK
Unique	PLT_CN, VVT_CN, SUBP	N/A	VSB_UK
	PLT_CN, VVT_CN, CN	N/A	VSB_UK2
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP	N/A	VSB_NAT_I

1. CN                      Sequence number. A unique sequence number used to identify a vegetation subplot record. Other tables reference this as VSB\_CN.
2. PLT\_CN                Plot sequence number. Foreign key linking the vegetation subplot record to the P2 plot record (via PLOT.CN).
3. VVT\_CN                Vegetation visit sequence number. Foreign key linking the vegetation subplot record to the vegetation visit record (via VEG\_VISIT.CN).
4. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

5. STATECD              State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

6. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
7. PLOT P2 plot number. An identifier for a plot. Along with STATECD, INVYR, and COUNTYCD, PLOT may be used to uniquely identify a plot.
8. SUBP Subplot number. A code indicating the number of the subplot.

Code	Subplot number
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

9. VEG\_SUBP\_STATUS\_CD

Vegetation subplot status code. A code indicating the vegetation subplot status as recorded when VEG\_VISIT.VEG\_MANUAL = 2.0 and higher. This value is derived when VEG\_VISIT.VEG\_MANUAL = 1.7 from P2 condition data, plot notes, and availability of various field-recorded records (e.g., subplot species and subplot totals).

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

10. VEG\_SUBP\_NONSAMPLE\_REASON\_CD

Vegetation subplot nonsampled reason code. A code indicating why a subplot cannot be sampled when VEG\_SUBP\_STATUS\_CD = 3. Codes 1-4 can be assigned to entire plots or portions of plots that are not sampled. Code 5 is assigned only when the entire plot is affected. If VEG\_SUBP\_STATUS\_CD = 1 or 2, this variable is not recorded. This value is derived for data collected with VEG\_VISIT.VEG\_MANUAL = 1.7.

Code	Vegetation subplot nonsampled reason
1	Outside U.S. boundary
2	Denied access area
3	Hazardous situation
4	Time limitation
5	Lost data (office use only)
10	Other

#### 11. SUBP\_ACCESSIBLE\_FOREST\_PCT

Subplot accessible forest percent. The percent of the subplot area in an accessible forested condition as estimated by the vegetation specialist when VEG\_VISIT.VEG\_MANUAL = 2.0 and higher. This value is derived from P2 subplot and condition data when VEG\_VISIT.VEG\_MANUAL = 1.7.

#### 12. DETAILED\_NONFOREST\_LAND\_USE

Detailed nonforest land use. A code indicating the NONFOREST land use of the portion of the subplot that is not forest. If more than one nonforest land use is present, the code that best describes the land use occurring closest to subplot center is recorded.

<b>Code</b>	<b>Detailed nonforest land use</b>
10	Agriculture
11	Cropland
12	Pasture
13	Idle farmland
14	Orchard
15	Christmas tree plantation
20	Rangeland
30	Developed
31	Cultural (business, residential, urban buildup)
32	Rights-of-way (improved roads, railway, power lines, canals)
33	Recreation (parks, ski areas, golf courses, etc)
40	Other (beach, desert, noncensus water, marsh, bog)

#### 13. TOTAL\_CANOPY\_COVER\_LAYER\_1

Total canopy cover layer 1. Estimated total canopy cover of the foliage of all vascular plants in Layer 1 within the accessible forested conditions on the subplot. A rapid canopy cover estimate is made, ignoring overlap among species. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 2, the assessment is made only within the accessible forested conditions on the subplot. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 1 and SUBP\_ACCESSIBLE\_FOREST\_PCT is at least 50 percent, the assessment is made over the entire subplot, including all conditions. See VEG\_VISIT.VEG\_SAMPLE\_BASIS for details.

#### 14. TOTAL\_CANOPY\_COVER\_LAYER\_2

Total canopy cover layer 2. Estimated total canopy cover of the foliage of all vascular plants in Layer 2. A rapid canopy cover estimate is made, ignoring overlap among species. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 2, the assessment is made only within the accessible forested conditions on the subplot. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 1 and

SUBP\_ACCESSIBLE\_FOREST\_PCT is at least 50 percent, the assessment is made over the entire subplot, including all conditions. See VEG\_VISIT.VEG\_SAMPLE\_BASIS for details.

15. TOTAL\_CANOPY\_COVER\_LAYER\_3

Total canopy cover layer 3. Estimated total canopy cover of the foliage of all vascular plants in Layer 3. A rapid canopy cover estimate is made, ignoring overlap among species. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 2, the assessment was made only within the accessible forested conditions on the subplot. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 1 and SUBP\_ACCESSIBLE\_FOREST\_PCT is at least 50 percent, the assessment is made over the entire subplot, including all conditions. See VEG\_VISIT.VEG\_SAMPLE\_BASIS for details.

16. TOTAL\_CANOPY\_COVER\_LAYER\_4

Total canopy cover layer 4. Estimate the total canopy cover of the foliage of all vascular plants in Layer 4. A rapid canopy cover estimate is made, ignoring overlap among species. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 2, the assessment was made only within the accessible forested conditions on the subplot. When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 1 and SUBP\_ACCESSIBLE\_FOREST\_PCT is at least 50 percent, the assessment is made over the entire subplot, including all conditions. See VEG\_VISIT.VEG\_SAMPLE\_BASIS for details.

17. CRYPTO\_CRUST\_COVER\_PCT

Cryptobiotic crust cover percent. The percent cryptobiotic crust cover on portions of the subplot designated as accessible forest condition. Cryptobiotic crust is a layer of symbiotic lichens and algae on the soil surface (common in arid regions). This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

18. LICHEN\_COVER\_PCT

Lichen cover percent. The percent lichen cover on portions of the subplot floor designated as accessible forest condition. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

19. LITTER\_DUFF\_COVER\_PCT

Litter and duff percent cover. The percent litter and duff cover on portions of the subplot floor designated as accessible forest condition. This is a continuous layer of accumulated organic matter

over forest mineral soil (e.g., scattered leaves over mineral soil is coded mineral soil). This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

20. MINERAL\_SOIL\_COVER\_PCT

Mineral soil cover percent. The percent mineral soil cover on portions of the subplot floor designated as accessible forest condition. This is physically weathered soil parent material that may or may not also be chemically and biologically altered. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

21. MOSS\_COVER\_PCT

Moss cover percent. The percent moss cover, including liverworts, on portions of the subplot floor designated as accessible forest condition. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

22. ROAD\_TRAIL\_COVER\_PCT

Road and trail cover percent. The percent road/trail cover on the portions of the subplot floor designated as accessible forest condition, including any areas compacted and unvegetated from regular use by foot travel or small motorized vehicles. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

23. ROCK\_COVER\_PCT

Rock cover percent. The percent rock cover on portions of the subplot floor designated as accessible forest condition, including any rocks, boulders, or accumulations of gravel (> 1/4 inch diameter) or pebbles. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

24. STANDING\_WATER\_COVER\_PCT

Standing water cover percent. The percent standing water/flooded cover on portions of the subplot designated as accessible forest condition, including any ponding or flowing water that is not contained within banks. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

## 25. STREAM\_LAKE\_COVER\_PCT

Stream and lake cover percent. The percent stream/lake cover on portions of the subplot designated as accessible forest condition, including any body of water contained within banks that is within a forested condition. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

## 26. TRASH\_JUNK\_COVER\_PCT

Trash and junk cover percent. The percent trash/junk/other cover on portions of the subplot floor designated as accessible forest condition. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

## 27. WOOD\_COVER\_PCT

Wood cover percent. The percent wood cover on portions of the subplot floor designated as accessible forest condition, including stumps, live trunks, roots, and wood pieces that average greater than 3 inches in diameter and are in contact with the ground. This variable was not collected under VEG\_VISIT.VEG\_MANUAL = 1.7.

## 28. VEG\_SUBP\_STATUS\_CD\_PRE2004

Vegetation subplot status code, pre2004. A code indicating the Vegetation Subplot Status Code consistent with VEG\_VISIT.VEG\_MANUAL = 1.7. The version 1.7 sample design required a subplot to be at least 50 percent forested in order to be sampled. If at least 50 percent of subplot area was accessible forest, the entire subplot was sampled, including all conditions. This variable is derived. For plots with VEG\_VISIT.VEG\_MANUAL = 1.7, this value is derived from P2 condition data, plot notes, and availability of various field-recorded records (e.g., subplot species and subplot totals.) For plots with VEG\_VISIT.VEG\_MANUAL = 2.0 and later, this value is derived in part from the field-collected SUBP\_ACCESSIBLE\_FOREST\_PCT.

### **Code    Vegetation subplot status code, pre 2004**

- |   |   |
|---|---|
| 1 | Sampled – subplot accessible forest condition is greater than or equal to 50 percent of subplot |
| 2 | Sampled – subplot accessible forest condition is less than 50 percent of subplot                |
| 3 | Nonsampled  |

29. VEG\_SUBP\_NONSMP\_RSN\_CD\_PRE2004

Vegetation subplot nonsampled reason code, pre2004. A code indicating the Vegetation Subplot Nonsampled Reason Code consistent with VEG\_VISIT.VEG\_MANUAL = 1.7 to describe reason for VEG\_SUBP\_NONSAMPLE\_REASN\_CD, P2 condition data, plot notes, and availability of various field-recorded records (e.g., subplot species and subplot totals.)

**Code   Vegetation subplot nonsampled reason, pre2004**

1	Outside U.S. boundary
2	Denied access area
3	Hazardous situation
4	Time Limitation
5	Lost data (office use only)
10	Other

30. CREATED\_BY

Created by. See VEG\_VISIT.CREATED\_BY description for definition.

31. CREATED\_DATE

Created date. See VEG\_VISIT.CREATED\_DATE description for definition.

32. CREATED\_IN\_INSTANCE

Created in instance. See VEG\_VISIT.CREATED\_IN\_INSTANCE description for definition.

33. MODIFIED\_BY

Modified by. See VEG\_VISIT.MODIFIED\_BY description for definition.

34. MODIFIED\_DATE

Modified date. See VEG\_VISIT.MODIFIED\_DATE description for definition.

35. MODIFIED\_IN\_INSTANCE

Modified in instance. See VEG\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

## Vegetation Quadrat Table (Oracle table name is VEG\_QUADRAT)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	VVT_CN	Vegetation visit sequence number	VARCHAR2(34)
4	VSB_CN	Vegetation subplot sequence number	VARCHAR2(34)
5	INVYR	Inventory year	NUMBER(4)
6	STATECD	State code	NUMBER(4)
7	COUNTYCD	County code	NUMBER(3)
8	PLOT	Phase 2 plot number	NUMBER(5)
9	SUBP	Subplot number	NUMBER(1)
10	QUADRAT	Quadrat number	NUMBER(1)
11	CONDID	Forest condition class	NUMBER(1)
12	QUADRAT_STATUS	Quadrat status	NUMBER(1)
13	QUADRAT_STATUS_PRE2004	Quadrat status of quadrats sampled before 2004	NUMBER(1)
14	TRAMPLING	Trampling	NUMBER(1)
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)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	VQT_PK
Unique	PLT_CN, VVT_CN, VSB_CN, QUADRAT	N/A	VQT_UK
	PLT_CN, VVT_CN, VSB_CN, CN	N/A	VQT_UK2
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP, QUADRAT	N/A	VQT_NAT_I
Foreign	PLT_CN, VVT_CN, VSB_CN	VEG_QUADRAT to VEG_SUBPLOT	VQT_VSB_FK

1. CN Sequence number. A unique sequence number used to identify a vegetation quadrat record. Other tables reference this as VQT\_CN.
2. PLT\_CN Plot sequence number. Foreign key linking the vegetation quadrat record to the P2 plot record (via PLOT.CN).

3. VVT\_CN Vegetation visit sequence number. Foreign key linking the vegetation quadrat record to the vegetation visit record (via VEG\_VISIT.CN).
4. VSB\_CN Vegetation subplot sequence number. Foreign key linking the vegetation quadrat record to the vegetation subplot record (via VEG\_SUBPLOT.CN).
5. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.
6. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
7. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
8. PLOT P2 plot number. An identifier for a plot. Along with STATECD, INVYR, and COUNTYCD, PLOT may be used to uniquely identify a plot.

9. SUBP Subplot number. A code indicating the number of the subplot where the quadrat was sampled.

<b>Code</b>	<b>Subplot number</b>
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

10. QUADRAT

Quadrat. A code indicating the number of the quadrat as determined by the transect originating from subplot center.

<b>Code</b>	<b>Quadrat</b>
1	Quadrat on 30 degree subplot transect
2	Quadrat on 150 degree subplot transect
3	Quadrat on 270 degree subplot transect

11. CONDIC

Condition class number. A code representing the condition with the greatest area in the quadrat. It is one of the unique identifying numbers 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.

12. QUADRAT\_STATUS

Quadrat status. A code indicating how the quadrat was sampled consistent with VEG\_VISIT.VEG\_MANUAL = 2.0 and higher. If QUADRAT\_STATUS is 1 or 3, the quadrat is sampled and data are collected even if no vascular plants are present. If the value entered is 2, 4, or 5, the quadrat is not sampled. This value is derived for VEG\_VISIT.VEG\_MANUAL = 1.7 plots.

<b>Code</b>	<b>Quadrat status</b>
1	Quadrat sampled (most of the quadrat is in an accessible forest condition)
2	Quadrat not sampled because most or all of it does not fall in an accessible forested condition class
3	Quadrat sampled, no vascular plants rooted in or overhanging within 6 feet of the ground surface
4	Quadrat not sampled, hazard present on quadrat
5	Quadrat not sampled, other reason – enter in plot notes

### 13. QUADRAT\_STATUS\_PRE2004

Quadrat status of quadrats sampled pre-2004. This code for quadrat status was collected when VEG\_VISIT.VEG\_MANUAL = 1.7 where data were collected on both forested and nonforested portions of a subplot with at least 50 percent accessible forest. This variable is not available for VEG\_VISIT.VEG\_MANUAL = 2.0 and higher.

**Code Quadrat status, pre2004**

- 1 Quadrat sampled (at least 50 percent of the subplot is in an accessible forest condition; quadrat may be nonforest or other condition)
- 2 Quadrat not sampled because the sum of all forested condition classes make up <50 percent of the subplot area
- 3 Quadrat sampled, no vascular plants rooted in or overhanging within 6 feet of the ground surface
- 4 Quadrat not sampled, hazard present on quadrat
- 5 Quadrat not sampled, other reason – enter in plot notes

14. TRAMPLING Trampling. A code indicating the amount of trampling present in each quadrat at the start of vegetation diversity measurements. Trampling is defined as damage to plants or disturbance of the ground layer by humans, livestock, or wildlife.

**Code Trampling**

- 1 Low: 0-10 percent of quadrat trampled: pristine to relatively undisturbed.
- 2 Moderate: 10-50 percent of quadrat trampled: trampling by animals or field crew
- 3 Heavy: >50 percent of quadrat trampled: hiking trail or heavily grazed.

### 15. CREATED\_BY

Created by. See VEG\_VISIT.CREATED\_BY description for definition.

### 16. CREATED\_DATE

Created date. See VEG\_VISIT.CREATED\_DATE description for definition.

### 17. CREATED\_IN\_INSTANCE

Created in instance. See VEG\_VISIT.CREATED\_IN\_INSTANCE description for definition.

### 18. MODIFIED\_BY

Modified by. See VEG\_VISIT.MODIFIED\_BY description for definition.

19. MODIFIED\_DATE

Modified date. See VEG\_VISIT.MODIFIED\_DATE description for definition.

20. MODIFIED\_IN\_INSTANCE

Modified in instance. See VEG\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

**Vegetation Subplot Species Table (Oracle table name is VEG\_SUBPLOT\_SPP)**

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	VVT_CN	Vegetation visit sequence number	VARCHAR2(34)
4	VSB_CN	Vegetation subplot sequence number	VARCHAR2(34)
5	VPS_CN	Vegetation plot species sequence number	VARCHAR2(34)
6	INVYR	Inventory year	NUMBER(4)
7	STATECD	State code	NUMBER(4)
8	COUNTYCD	County code	NUMBER(3)
9	PLOT	Phase 2 plot number	NUMBER(5)
10	SUBP	Subplot number	NUMBER(1)
11	VEG_FLDSPCD	Vegetation field species code	VARCHAR2(16)
12	UNIQUE_SP_NBR	Unique species code	NUMBER(2)
13	VEG_SPCD	Vegetation species code	VARCHAR2(16)
14	SP_CANOPY_COVER_TOTAL	Subplot species canopy cover total	NUMBER(5,2)
15	SP_CANOPY_COVER_LAYER_1_2	Subplot species canopy cover layers 1 and 2	NUMBER(5,2)
16	SP_CANOPY_COVER_LAYER_3	Subplot species canopy cover layer 3	NUMBER(5,2)
17	SP_CANOPY_COVER_LAYER_4	Subplot species canopy cover layer 4	NUMBER(5,2)
18	QUAD_1_PRESENCE	Quadrat 1 presence	NUMBER(1)
19	QUAD_2_PRESENCE	Quadrat 2 presence	NUMBER(1)
20	QUAD_3_PRESENCE	Quadrat 3 presence	NUMBER(1)
21	DUMMY_SUBP_COVER_PRE2004	Dummy subplot cover for data collected prior to 2004	NUMBER(1)
22	MAX_COVER_LAYER_NBR_PRE2004	Maximum cover layer number for data collected prior to 2004	NUMBER(1)
23	CREATED_BY	Created by	VARCHAR2(30)
24	CREATED_DATE	Created date	DATE
25	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
26	MODIFIED_BY	Modified by	VARCHAR2(30)
27	MODIFIED_DATE	Modified date	DATE
28	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

Type of Key	Column(s) order	Tables to link	Abbreviated notation
Primary	CN	N/A	VSS_PK
Unique	PLT_CN, VVT_CN, VPS_CN, VSB_CN	N/A	VSS_UK
Natural	STATECD, INVYR, COUNTYCD, PLOT, SUBP, UNIQUE_SP_NBR, VEG_SPCD	N/A	VSS_NAT_I
Foreign	PLT_CN, VVT_CN, VSB_CN	VEG_SUBPLOT_SPP to VEG_SUBPLOT	VSS_VSB_FK
	PLT_CN, VVT_CN, VPS_CN	VEG_SUBPLOT_SPP to VEG_PLOT_SPECIES	VSS_VPS_FK

1. CN                      Sequence number. A unique sequence number used to identify a vegetation subplot species record in this table.
2. PLT\_CN                Plot sequence number. Foreign key linking the vegetation subplot species record to the P2 plot record (via PLOT.CN).
3. VVT\_CN                Vegetation visit sequence number. Foreign key linking the vegetation subplot species record to the vegetation visit record (via VEG\_VISIT.CN).
4. VSB\_CN                Vegetation subplot sequence number. Foreign Key linking the vegetation subplot species record to the vegetation subplot record (via VEG\_SUBPLOT.CN).
5. VPS\_CN                Vegetation plot species sequence number. Foreign key linking the vegetation subplot species record to the vegetation plot species record (via VEG\_PLOT\_SPECIES.CN).
6. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users

interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

- 7. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 8. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 9. PLOT P2 plot number. An identifier for a plot. Along with STATECD, INVYR, and COUNTYCD, PLOT may be used to uniquely identify a plot.
- 10. SUBP Subplot number. A code indicating the number of the subplot center that was sampled.

Code	Subplot number
1	Center subplot
2	North subplot
3	Southeast subplot
4	Southwest subplot

11. VEG\_FLDSPCD

Vegetation field species code. Field-recorded vegetation species code for each vascular plant species found rooted in or overhanging a subplot. Combined with UNIQUE\_SP\_NBR to identify what was believed in the field to be a unique species on the plot. For VEG\_VISIT.VEG\_MANUAL = 2.0.1 and higher, codes are the standardized codes in the Natural Resource Conservation Service (NRCS) PLANTS database January 2010 version to represent species, genus, or unknown plants. Identification to species only is expected. However, if subspecies information is known, the appropriate NRCS code is entered. This attribute is assigned in the field and never changes. Updates to unknown species codes are recorded in VEG\_SPCD. For VEG\_VISIT.VEG\_MANUAL = 1.7, the VEG\_FLDSPCD may not be a valid NRCS code for unknown plant species, as these

were typically recorded as UN; however, these codes are resolved to valid NRCS codes in VEG\_SPCD.

#### 12. UNIQUE\_SP\_NBR

Unique species number. This code combined with VEG\_FLDSPCD identifies what was believed to be a unique species on the plot. Specifically, it identifies the number of species recorded for each NRCS genus or unknown code. For example, two unidentifiable *Carex* spp. would be entered as two separate records with VEG\_FLDSPCD = 'CAREX' and differing UNIQUE\_SP\_NBRs to show that they are not the same species. If the VEG\_FLDSPCD entered already identifies a specific species (e.g., PIST for *Pinus strobus*), then UNIQUE\_SP\_NBR = 1.

13. VEG\_SPCD Vegetation species code. Final edited species code, including any resolution of collected unknown plant specimens (e.g., herbarium-resolved species) and conforming to the NRCS PLANTS database as downloaded in January 2010.

#### 14. SP\_CANOPY\_COVER\_TOTAL

Subplot species canopy cover total. Ocular estimate of percent canopy cover of species on the subplot. Total cover estimate is always based on the area of a 24-foot-radius circle. That is, if a species total cover is about equal to a circle with a radius of 5.3 feet in the area of the subplot assessed, the subplot species canopy cover is recorded as 5 percent, regardless of the total percent accessible forest on the subplot. However, for plots collected with VEG\_VISIT.VEG\_SAMPLE\_BASIS = 1, if a subplot was at least 50 percent forested, the entire subplot area was assessed (and so the species cover may occur over nonforest, hazardous, or access-denied areas as well as the accessible forest). When VEG\_VISIT.VEG\_SAMPLE\_BASIS = 2, only accessible forest is assessed. The difference between VEG\_SAMPLE\_BASIS = 1 and VEG\_SAMPLE\_BASIS = 2 affects how data are compiled to determine cover of a species as a percent of the accessible forested portion of a subplot. See VEG\_VISIT.VEG\_SAMPLE\_BASIS for details.

#### 15. SP\_CANOPY\_COVER\_LAYER\_1\_2

Subplot species canopy cover layers 1 and 2. Species canopy cover percent within a layer from the ground to 6 feet in height across all accessible forest land on subplot, based on the area of a 24-foot-radius circle. This variable is blank (null) when VEG\_VISIT.VEG\_MANUAL = 1.7.

16. SP\_CANOPY\_COVER\_LAYER\_3

Subplot species canopy cover layer 3. Species canopy cover percent within a layer from 6 to 16 feet in height across all accessible forest land on subplot, based on the area of a 24-foot-radius circle. This variable is blank (null) when VEG\_VISIT.VEG\_MANUAL = 1.7.

17. SP\_CANOPY\_COVER\_LAYER\_4

Subplot species canopy cover layer 4. Species canopy cover percent within a layer from 16 feet in height and above across all accessible forest land on subplot, based on the area of a 24-foot radius circle. This variable is blank (null) when VEG\_VISIT.VEG\_MANUAL = 1.7.

18. QUAD\_1\_PRESENCE

Quadrat 1 presence. A code indicating whether the species is found on quadrat 1 of the current subplot.

<b>Code</b>	<b>Quadrat 1 presence</b>
0	No, the species is not present
1	Yes, the species is present

19. QUAD\_2\_PRESENCE

Quadrat 2 presence. A code indicating whether the species is found on quadrat 2 of the current subplot.

<b>Code</b>	<b>Quadrat 2 presence</b>
0	No, the species is not present
1	Yes, the species is present

20. QUAD\_3\_PRESENCE

Quadrat 3 presence. A code indicating whether the species is found on quadrat 3 of the current subplot.

<b>Code</b>	<b>Quadrat 3 presence</b>
0	No, the species is not present
1	Yes, the species is present

21. DUMMY\_SUBP\_COVER\_PRE2004

Dummy subplot cover for data collected prior to 2004. This code indicates whether a dummy SP\_CANOPY\_COVER\_TOTAL value was added in office (VEG\_VISIT.VEG\_MANUAL = 1.7 only) where a quadrat species record existed without a matching subplot species record. When

DUMMY\_SUBP\_COVER\_PRE2004 = 1,  
SP\_CANOPY\_COVER\_TOTAL is set to 1 and  
MAX\_COVER\_LAYER\_NBR\_PRE2004 is blank (null). This  
variable is not available for VEG\_VISIT.VEG\_MANUAL = 2.0  
and later.

<b>Code</b>	<b>Dummy subplot cover for data collected prior to 2004</b>
0	Subplot species cover data are field recorded
1	Dummy subplot cover data added where a quadrat species record existed without a matching subplot species record (VEG_VISIT.VEG_MANUAL = 1.7).

## 22. MAX\_COVER\_LAYER\_NBR\_PRE2004

Maximum cover layer number for data collected prior to 2004. A code indicating the layer number with maximum cover for the species on the subplot. This code was field recorded when VEG\_VISIT.VEG\_MANUAL = 1.7 and DUMMY\_SUBP\_COVER\_PRE2004 = 0; otherwise it is null. This variable was not collected for VEG\_VISIT.VEG\_MANUAL = 2.0 and later.

<b>Code</b>	<b>Maximum cover layer number for data collected before 2004</b>
1	0 – 2 feet above ground
2	>2 – 6 feet above ground
3	>6-16 feet above ground
4	>16 above ground

## 23. CREATED\_BY

Created by. See VEG\_VISIT.CREATED\_BY description for definition.

## 24. CREATED\_DATE

Created date. See VEG\_VISIT.CREATED\_DATE description for definition.

## 25. CREATED\_IN\_INSTANCE

Created in instance. See VEG\_VISIT.CREATED\_IN\_INSTANCE description for definition.

## 26. MODIFIED\_BY

Modified by. See VEG\_VISIT.MODIFIED\_BY description for definition.

27. MODIFIED\_DATE

Modified date. See VEG\_VISIT.MODIFIED\_DATE description for definition.

28. MODIFIED\_IN\_INSTANCE

Modified in instance. See VEG\_VISIT.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)

	Column Name	Descriptive Name	Oracle Data Type
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)
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 Lycopodiophyta; Class Lycopodiopsida; Order Lycopodiales (clubmoss)
Monocot	Division Magnoliophyta; Class Liliopsida
Psilophyte	Division Psilophyta (whisk-ferns)
Quillwort	Division Lycopodiophyta; 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 ( <i>Isoetes</i> ).
Liana	Climbing plant found in tropical forests with long, woody rope-like stems of anomalous anatomical structure.

<b>Code</b>	<b>Growth habit</b>
Shrub	Grass or grass-like plant, including grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), arrow-grasses (Juncaginaceae), and quillworts ( <i>Isoetes</i> ).
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.

<b>Code</b>	<b>Duration</b>
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:

<b>Code</b>	<b>United States nativity</b>
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:**

<b>Code</b>	<b>United States nativity</b>
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. The employee who created the record. This attribute is intentionally left blank in download files.
35. CREATED\_DATE  
Created date. The date on which the record was created. Date will be in the form DD-MON-YYYY.

36. 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.

37. 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.

38. MODIFIED\_DATE

Modified date. The date on which 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.

39. 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.

## 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	SMPKND CD	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. 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 those Western P3 plots that are “off subpanel” because of differences in measurement intervals between P3 (measurement interval=5 years) and P2 (measurement interval=10 years) plots. Only users interested in performing certain P3 data analyses should access plots with this anomalous value in INVYR.

- 4. STATECD State code. Bureau of the Census Federal Information Processing Standards (FIPS) two-digit code for each state. Refer to appendix C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
- 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	Month	Code	Month
01	January	07	July
02	February	08	August
03	March	09	September
04	April	10	October
05	May	11	November
06	June	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.

<b>Code</b>	<b>Quality assurance status</b>
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.

<b>Code</b>	<b>Crew type</b>
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.

<b>Code</b>	<b>Sample kind code</b>
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. The employee who created the record. This attribute is intentionally left blank in download files.

14. CREATED\_DATE

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

15. 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.

16. 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.

## 17. MODIFIED\_DATE

Modified date. The date on which 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.

## 18. 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.

**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, national caore 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	Munber of logs (pieces) per acre in the condition, regional design	NUMBER
32	COVER_PCT_RGN	Percent cover, represented by each coarse	NUMBER(3)

Column Name	Descriptive Name	Oracle data type
	woody debris piece, regional design	
33 CHRCO_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 DWM\_VISIT.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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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 B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 6). PLOT.DESIGNCD, appendix B, and table 6 are in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

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. CONDIC 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 in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>) 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  $\geq 5.0$  inches in diameter,  $\geq 5.0$  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
<b>1</b>	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
<b>2</b>	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
<b>3</b>	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
<b>4</b>	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
<b>5</b>	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.

<b>Code</b>	<b>Hollow</b>
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.

<b>Code</b>	<b>Coarse woody debris history</b>
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 DECA YCD. 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 DECA YCD. 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.

<b>Code</b>	<b>Description</b>
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 DWM\_VISIT.CREATED\_BY description for definition.

36. CREATED\_DATE

Created date. See DWM\_VISIT.CREATED\_DATE description for definition.

37. CREATED\_IN\_INSTANCE

Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.

38. MODIFIED\_BY

Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.

39. MODIFIED\_DATE

Modified date. See DWM\_VISIT.MODIFIED\_DATE description for definition.

40. MODIFIED\_IN\_INSTANCE

Modified in instance. See DWM\_VISIT.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 DWM\_VISIT.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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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 B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 6). PLOT.DESIGNCD, appendix B, and table 6 are in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

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. CONDIC 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 DWM\_VISIT.CREATED\_BY description for definition.
  
17. CREATED\_DATE  
  
Created date. See DWM\_VISIT.CREATED\_DATE description for definition.
  
18. CREATED\_IN\_INSTANCE  
  
Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.
  
19. MODIFIED\_BY  
  
Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.
  
20. MODIFIED\_DATE  
  
Modified date. See DWM\_VISIT.MODIFIED\_DATE description for definition.
  
21. MODIFIED\_IN\_INSTANCE  
  
Modified in instance. See DWM\_VISIT.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 DWM\_VISIT.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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
  
5. COUNTYCD            County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
  
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 B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 6). PLOT.DESIGNCD, appendix B, and table 6 are in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

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.

<b>Code</b>	<b>Reason count</b>
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.

<b>Code</b>	<b>Piles</b>
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 DWM\_VISIT.CREATED\_BY description for definition.

26. CREATED\_DATE

Created date. See DWM\_VISIT.CREATED\_DATE description for definition.

27. CREATED\_IN\_INSTANCE

Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.

28. MODIFIED\_BY

Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.

29. MODIFIED\_DATE

Modified date. See DWM\_VISIT.MODIFIED\_DATE description for definition.

30. MODIFIED\_IN\_INSTANCE

Modified in instance. See DWM\_VISIT.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 DWM\_VISIT.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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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 B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 6). PLOT.DESIGNCD, appendix B, and table 6 are in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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%
...	
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.

<b>Code</b>	<b>Dead shrub</b>
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
...	
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.

<b>Code</b>	<b>Live herb</b>
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
...	
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.

<b>Code</b>	<b>Dead herb</b>
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
...	
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)
10	1-10%
20	11-20%
30	21-30%
...	
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  $\geq$  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  $\geq$  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 DWM\_VISIT.CREATED\_BY description for definition.
19. CREATED\_DATE  
 Created date. See DWM\_VISIT.CREATED\_DATE description for definition.
20. CREATED\_IN\_INSTANCE  
 Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.
21. MODIFIED\_BY  
 Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.

22. MODIFIED\_DATE

Modified date. See DWM\_VISIT.MODIFIED\_DATE description for definition.

23. MODIFIED\_IN\_INSTANCE

Modified in instance. See DWM\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

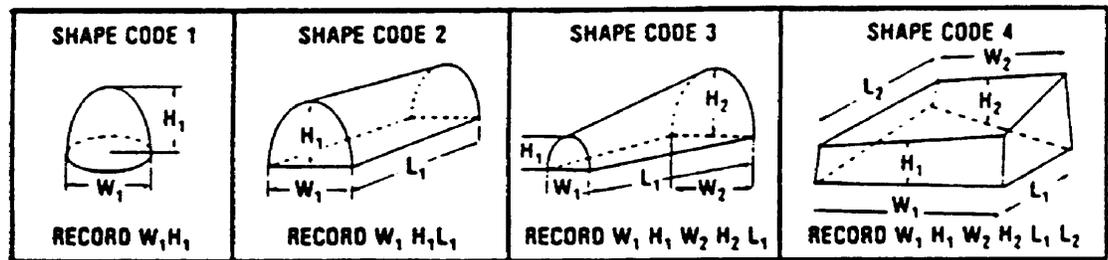
**Down Woody Material Residual Pile Table (Oracle table name is DWM\_RESIDUAL\_PILE)**

	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 DWM\_VISIT.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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. COUNTYCD            County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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 B for information about plot designs. For more explanation about SUBP, contact the appropriate FIA work unit (table 6). PLOT.DESIGNCD, appendix B, and table 6 are in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

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. Refer to the Condition table in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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  $\geq 3$  inches. Air, soil, rock, and live plants are not included in the estimate. Estimated to the nearest 10 percent.

<b>Code</b>	<b>Density</b>
00	Absent
01	Trace (<1% cover)
10	1-10%
20	11-20%
30	21-30%
...	
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 DWM\_VISIT.CREATED\_BY description for definition.

27. CREATED\_DATE

Created date. See DWM\_VISIT.CREATED\_DATE description for definition.

28. CREATED\_IN\_INSTANCE

Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.

29. MODIFIED\_BY

Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.

30. MODIFIED\_IN\_INSTANCE

Modified in instance. See DWM\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

31. MODIFIED\_DATE

Modified date. See DWM\_VISIT.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 **DWM\_VISIT.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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
5. **COUNTYCD** County code. The identification number for a county, parish, watershed, borough, or similar governmental unit in a State. FIPS codes from the Bureau of the Census are used. Refer to appendix C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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 B for information about plot designs. For more explanation about **SUBP**, contact the appropriate FIA work unit (table 6). **PLOT.DESIGNCD**, appendix B, and table 6 are in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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.
 

<b>Code</b>	<b>Transect</b>
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 DWM\_VISIT.CREATED\_BY description for definition.

19. CREATED\_DATE

Created date. See DWM\_VISIT.CREATED\_DATE description for definition.

20. CREATED\_IN\_INSTANCE

Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.

21. MODIFIED\_BY

Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.

22. MODIFIED\_IN\_INSTANCE

Modified in instance. See  
DWM\_VISIT.MODIFIED\_IN\_INSTANCE description for  
definition.

23. MODIFIED\_DATE

Modified date. See DWM\_VISIT.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

Column Name	Descriptive Name	Oracle data type
27 CWD_DRYBIO_COND	Coarse woody debris biomass per acre in the condition	NUMBER
28 CWD_DRYBIO_UNADJ	Coarse woody debris biomass per acre, unadjusted	NUMBER
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

	Column Name	Descriptive Name	Oracle data type
53	FWD_MD_DRYBIO_COND	Medium-size class fine woody debris biomass per acre in the condition	NUMBER
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

Column Name	Descriptive Name	Oracle data type
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
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
	STATECD, COUNTYCD, PLOT, INVYR, CONDID, EVALID, RSCD	N/A	CDC_UK2
	STATECD, CYCLE, SUBCYCLE, COUNTYCD, PLOT, CONDID, EVALID, RSCD	N/A	CDC_UK3
Foreign	CND_CN	COND_DWM_CALC to COND	CDC_CND_FK
	PLT_CN	COND_DWM_CALC to PLOT	CDC_PLT_FK
	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 C in the P2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).
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 C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>).

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 DWM\_VISIT.INVYR description for definition.
7. CONDIC 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.CONDIC 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 on 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\_INADJ), 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  $CWD\_TL\_COND / (\text{sum of } CWD\_TL\_COND \text{ on forest conditions})$  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\_ADJ), 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\_CARBO<sub>N</sub>\_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  $\frac{1}{4}$  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 DWM\_VISIT.CREATED\_BY description for definition.

98. CREATED\_DATE

Created date. See DWM\_VISIT.CREATED\_DATE description for definition.

99. CREATED\_IN\_INSTANCE

Created in instance. See DWM\_VISIT.CREATED\_IN\_INSTANCE description for definition.

100. MODIFIED\_BY

Modified by. See DWM\_VISIT.MODIFIED\_BY description for definition.

101. MODIFIED\_DATE

Modified date. See DWM\_VISIT.MODIFIED\_DATE description for definition.

102. MODIFIED\_IN\_INSTANCE

Modified in instance. See DWM\_VISIT.MODIFIED\_IN\_INSTANCE description for definition.

103. CYCLE

Inventory cycle number. See DWM\_VISIT.CYCLE description for definition.

104. SUBCYCLE

Inventory subcycle number. See DWM\_VISIT.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 C in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)

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. Refer to appendix C in the P2 document for more information (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 5.1.4 for P2, available at: <http://www.fia.fs.fed.us/library/database-documentation/>)

<b>Code</b>	<b>Description</b>
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)

## Chapter 3 -- Views

### Summarization of Veg Data

The first step in putting the data in a format that can be easily used for estimating species quadrat frequency and quadrat-level species richness is the creation of a QUADRAT\_SPP table. The data presented in this table originates from the Vegetation Subplot Species Table (VEG\_SUBPLOT\_SPP). In VEG\_SUBPLOT\_SPP, each subplot species record contains presence/absence information on each quadrat.

Species quadrat frequency is determined by dividing the number of quadrats where a species was recorded by the total number of quadrats sampled. The Quadrat Species table is used to determine the number of quadrats where a species was recorded. The total number of quadrats sampled is determined from the Vegetation Quadrat Table (QUADRAT\_STATUS = 1 or 3).

Quadrat species richness is the number of species found on a quadrat (on a standard area of 1 m<sup>2</sup>). This view is used to determine the number of species on each quadrat where QUADRAT\_STATUS = 1. Population estimates of quadrat species richness must also include quadrats where QUADRAT\_STATUS = 3 (quadrat sampled, but no vascular plants were rooted in or overhanging within 6 feet).

```
CREATE OR REPLACE TABLE VEG_QUADRAT_SPP
(PLT_CN, VVT_CN, VSB_CN, VQT_CN, VPS_CN,
 STATECD, INVYR, COUNTYCD, PLOT, SUBP,
 QUADRAT, VEG_FLDSPCD, UNIQUE_SP_NBR, VEG_SPCD)
AS
Select
"PLT_CN","VVT_CN","VSB_CN","VQT_CN","VPS_CN","STATECD","INVYR","COUNTYCD","PLOT",
"SUBP","QUADRAT","VEG_FLDSPCD","UNIQUE_SP_NBR","VEG_SPCD"
from
(SELECT vss.plt_cn, vss.vvt_cn, vsb.cn as vsb_cn, vqt.cn as vqt_cn, vss.vps_cn,
 plt.statecd, plt.invyr, plt.countycd, plt.plot,
 vss.subp, 1 AS quadrat,
 vps.veg fldspcd, vps.unique_sp_nbr, vps.veg_spcd
FROM veg_visit vvt,
 plot plt,
 veg_plot_species vps,
 veg_subplot vsb,
 veg_subplot_spp vss,
 veg_quadrat vqt
WHERE plt.cn = vvt.plt_cn
AND vvt.cn = vps.vvt_cn
AND vps.cn = vss.vps_cn
AND vvt.cn = vsb.vvt_cn
AND vsb.vvt_cn = vps.vvt_cn
AND vsb.subp = vss.subp
AND vqt.vsb_cn = vsb.cn
AND vqt.quadrat = 1
AND vss.quad_1_presence = 1
UNION
```

```
SELECT vss.plt_cn, vss.vvt_cn, vsb.cn as vsb_cn, vqt.cn as vqt_cn, vss.vps_cn,
  plt.statecd, plt.invyr, plt.countycd, plt.plot,
  vss.subp, 2 AS quadrat,
  vps.veg fldspcd, vps.unique_sp_nbr, vps.veg_spcd
FROM veg_visit vvt,
  plot plt,
  veg_plot_species vps,
  veg_subplot vsb,
  veg_subplot_spp vss,
  veg_quadrat vqt
WHERE plt.cn = vvt.plt_cn
  AND vvt.cn = vps.vvt_cn
  AND vps.cn = vss.vps_cn
  AND vvt.cn = vsb.vvt_cn
  AND vsb.vvt_cn = vps.vvt_cn
  AND vsb.subp = vss.subp
  AND vqt.vsb_cn = vsb.cn
  AND vqt.quadrat = 2
  AND vss.quad_2_presence = 1
UNION
SELECT vss.plt_cn, vss.vvt_cn, vsb.cn as vsb_cn, vqt.cn as vqt_cn, vss.vps_cn,
  plt.statecd, plt.invyr, plt.countycd, plt.plot,
  vss.subp, 3 AS quadrat,
  vps.veg fldspcd, vps.unique_sp_nbr, vps.veg_spcd
FROM veg_visit vvt,
  plot plt,
  veg_plot_species vps,
  veg_subplot vsb,
  veg_subplot_spp vss,
  veg_quadrat vqt
WHERE plt.cn = vvt.plt_cn
  AND vvt.cn = vps.vvt_cn
  AND vps.cn = vss.vps_cn
  AND vvt.cn = vsb.vvt_cn
  AND vsb.vvt_cn = vps.vvt_cn
  AND vsb.subp = vss.subp
  AND vqt.vsb_cn = vsb.cn
  AND vqt.quadrat = 3
  AND vss.quad_3_presence = 1
) a
  order by a.statecd, a.invyr, a.countycd, a.plot, a.subp, a.quadrat;
```

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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 of the attribute.

Column name with (field guide section)	Table name	Location in table	Description
ABUNDANCE_CLASS (21.3.12)	LICHEN_LAB	9	Abundance class
AIR_DRY_SOIL_WT	SOILS_LAB	16	Air-dry soil weight
AMNT_MAX	OZONE_SPECIES_SUMMARY	11	Amount maximum
AMNT_MEAN	OZONE_SPECIES_SUMMARY	13	Amount mean
AMNT_MIN	OZONE_SPECIES_SUMMARY	12	Amount minimum
ASPECT (20.4.10)	OZONE_PLOT_SUMMARY	13	Aspect
ASPECT (20.4.10)	OZONE_SPECIES_SUMMARY	24	Aspect
ASPECT (20.4.10)	OZONE_VISIT	14	Aspect
AVG_WOOD_DENSITY	COND_DWM_CALC	96	Average wood density
AZIMUTH (25.9.3)	DWM_RESIDUAL_PILE	12	Bearing from subplot to pile (deg)
BIOSITE_INDEX	OZONE_BIOSITE_SUMMARY	14	Biosite index
BIOSITE_INDEX	OZONE_PLOT_SUMMARY	10	Biosite index
BIOSITE_INDEX_MULTIPLIER	OZONE_BIOSITE_SUMMARY	15	Biosite index multiplier
BIOSITE_INDEX_MULTIPLIER	OZONE_PLOT_SUMMARY	19	Biosite index multiplier
BIOSPCD (20.6.1)	OZONE_SPECIES_SUMMARY	10	Bioindicator species code
BIOSPCD (20.6.1)	OZONE_VALIDATION	9	Bioindicator species code
BIOSPCD_INDEX	OZONE_SPECIES_SUMMARY	21	Bioindicator species index
BIOSPCD_SUM	OZONE_SPECIES_SUMMARY	20	Bioindicator species sum
BRAY1_P	SOILS_LAB	43	Bray 1 phosphorus
BULK_DENSITY	SOILS_LAB	21	Bulk density
C_INORG_PCT	SOILS_LAB	24	Carbon inorganic percent
C_ORG_PCT	SOILS_LAB	23	Carbon organic percent
C_TOTAL_PCT	SOILS_LAB	25	Carbon total percent
CARBON	DWM_COARSE_WOODY_DEBRIS	24	Carbon mass of the piece
CARBON	DWM_RESIDUAL_PILE	22	Carbon mass
CATEGORY	REF_PLANT_DICTIONARY	8	Category
CHRCO_PNWR	DWM_COARSE_WOODY_DEBRIS	33	Charred by fire code, Pacific Northwest Research Station
CN	COND_DWM_CALC	1	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	LICHEN_LAB	1	Sequence number
CN	LICHEN_PLOT_SUMMARY	1	Sequence number
CN	LICHEN_SPECIES_SUMMARY	1	Sequence number
CN	LICHEN_VISIT	1	Sequence number
CN	OZONE_BIOSITE_SUMMARY	1	Sequence number

Column name with (field guide section)	Table name	Location in table	Description
CN	OZONE_PLOT	1	Sequence number
CN	OZONE_PLOT_SUMMARY	1	Sequence number
CN	OZONE_SPECIES_SUMMARY	1	Sequence number
CN	OZONE_VALIDATION	1	Sequence number
CN	OZONE_VISIT	1	Sequence number
CN	REF_LICHEN_SPECIES	7	Sequence number
CN	REF_LICHEN_SPP_COMMENTS	6	Sequence number
CN	REF_PLANT_DICTIONARY	1	Sequence number
CN	SOILS_EROSION	1	Sequence number
CN	SOILS_LAB	1	Sequence number
CN	SOILS_SAMPLE_LOC	1	Sequence number
CN	SOILS_VISIT	1	Sequence number
CN	VEG_PLOT_SPECIES	1	Sequence number
CN	VEG_QUADRAT	1	Sequence number
CN	VEG_SUBPLOT	1	Sequence number
CN	VEG_SUBPLOT_SPP	1	Sequence number
CN	VEG_VISIT	1	Sequence number
CND_CN	COND_DWM_CALC	10	Condition sequence number
COARSE_FRACTION_PCT	SOILS_LAB	22	Coarse fraction percent
COMMON_NAME	REF_PLANT_DICTIONARY	7	Common name
COMPCPCT (22.7.2)	SOILS_EROSION	10	Compact percent (percent compacted area)
CONDID	COND_DWM_CALC	7	Condition class number
CONDID	DWM_COARSE_WOODY_DEBRIS	11	Condition class number
CONDID	DWM_DUFF_LITTER_FUEL	10	Condition class number
CONDID (25.6.2)	DWM_FINE_WOODY_DEBRIS	9	Condition class number
CONDID (25.9.2)	DWM_RESIDUAL_PILE	10	Forest condition class of pile
CONDID (25.4.3)	DWM_TRANSECT_SEGMENT	11	Condition class number
CONDID (22.8.11)	SOILS_SAMPLE_LOC	19	Forest condition class number
CONDID (24.7.3)	VEG_QUADRAT	11	Condition class number
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 for medium-sized pieces, in the condition
CONDPROP_FWD_SM	COND_DWM_CALC	14	Proportion of fine woody debris transects for small-sized pieces, in the condition
COUNTYCD	COND_DWM_CALC	3	County code
COUNTYCD	DWM_COARSE_WOODY_DEBRIS	5	County code
COUNTYCD	DWM_DUFF_LITTER_FUEL	5	County code
COUNTYCD	DWM_FINE_WOODY_DEBRIS	5	County code

Column name with (field guide section)	Table name	Location in table	Description
COUNTYCD	DWM_MICROPLOT_FUEL	5	County code
COUNTYCD	DWM_RESIDUAL_PILE	5	County code
COUNTYCD	DWM_TRANSECT_SEGMENT	5	County code
COUNTYCD	DWM_VISIT	5	County code
COUNTYCD (21.3.5)	LICHEN_LAB	5	County code
COUNTYCD (21.3.5)	LICHEN_PLOT_SUMMARY	5	County code
COUNTYCD (21.3.5)	LICHEN_VISIT	5	County code
COUNTYCD (20.4.2)	OZONE_BIOSITE_SUMMARY	4	County code
COUNTYCD (20.4.2)	OZONE_PLOT	7	County code
COUNTYCD (20.4.2)	OZONE_PLOT_SUMMARY	4	County code
COUNTYCD (20.4.2)	OZONE_SPECIES_SUMMARY	4	County code
COUNTYCD (20.4.2)	OZONE_VALIDATION	5	County code
COUNTYCD (20.4.2)	OZONE_VISIT	5	County code
COUNTYCD	SOILS_EROSION	5	County code
COUNTYCD	SOILS_LAB	5	County code
COUNTYCD	SOILS_SAMPLE_LOC	5	County code
COUNTYCD	SOILS_VISIT	5	County code
COUNTYCD (24.3.2)	VEG_PLOT_SPECIES	6	County code
COUNTYCD (24.3.2)	VEG_QUADRAT	7	County code
COUNTYCD (24.3.2)	VEG_SUBPLOT	6	County code
COUNTYCD (24.3.2)	VEG_SUBPLOT_SPP	8	County code
COUNTYCD (24.3.2)	VEG_VISIT	5	County code
COVER_PCT	DWM_COARSE_WOODY_DEBRIS	25	Percent cover represented by each coarse woody debris piece, core design
COVER_PCT_RGN	DWM_COARSE_WOODY_DEBRIS	32	Percent cover, represented by each coarse woody debris piece, regional design
CREATED_BY	COND_DWM_CALC	97	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	LICHEN_LAB	12	Created by
CREATED_BY	LICHEN_PLOT_SUMMARY	12	Created by
CREATED_BY	LICHEN_SPECIES_SUMMARY	13	Created by
CREATED_BY	LICHEN_VISIT	32	Created by
CREATED_BY	OZONE_BIOSITE_SUMMARY	22	Created by
CREATED_BY	OZONE_PLOT	19	Created by
CREATED_BY	OZONE_PLOT_SUMMARY	22	Created by
CREATED_BY	OZONE_SPECIES_SUMMARY	30	Created by
CREATED_BY	OZONE_VALIDATION	16	Created by
CREATED_BY	OZONE_VISIT	23	Created by
CREATED_BY	REF_LICHEN_SPECIES	8	Created by
CREATED_BY	REF_LICHEN_SPP_COMMENTS	7	Created by
CREATED_BY	REF_PLANT_DICTIONARY	34	Created by
CREATED_BY	SOILS_EROSION	15	Created by
CREATED_BY	SOILS_LAB	49	Created by
CREATED_BY	SOILS_SAMPLE_LOC	25	Created by

Column name with (field guide section)	Table name	Location in table	Description
CREATED_BY	SOILS_VISIT	10	Created by
CREATED_BY	VEG_PLOT_SPECIES	15	Created by
CREATED_BY	VEG_QUADRAT	15	Created by
CREATED_BY	VEG_SUBPLOT	30	Created by
CREATED_BY	VEG_SUBPLOT_SPP	23	Created by
CREATED_BY	VEG_VISIT	15	Created by
CREATED_DATE	COND_DWM_CALC	98	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	LICHEN_LAB	13	Created date
CREATED_DATE	LICHEN_PLOT_SUMMARY	13	Created date
CREATED_DATE	LICHEN_SPECIES_SUMMARY	14	Created date
CREATED_DATE	LICHEN_VISIT	33	Created date
CREATED_DATE	OZONE_BIOSITE_SUMMARY	23	Created date
CREATED_DATE	OZONE_PLOT	20	Created date
CREATED_DATE	OZONE_PLOT_SUMMARY	23	Created date
CREATED_DATE	OZONE_SPECIES_SUMMARY	31	Created date
CREATED_DATE	OZONE_VALIDATION	17	Created date
CREATED_DATE	OZONE_VISIT	24	Created date
CREATED_DATE	REF_LICHEN_SPECIES	9	Created date
CREATED_DATE	REF_LICHEN_SPP_COMMENTS	8	Created date
CREATED_DATE	REF_PLANT_DICTIONARY	35	Created date
CREATED_DATE	SOILS_EROSION	16	Created date
CREATED_DATE	SOILS_LAB	50	Created date
CREATED_DATE	SOILS_SAMPLE_LOC	26	Created date
CREATED_DATE	SOILS_VISIT	11	Created date
CREATED_DATE	VEG_PLOT_SPECIES	16	Created date
CREATED_DATE	VEG_QUADRAT	16	Created date
CREATED_DATE	VEG_SUBPLOT	31	Created date
CREATED_DATE	VEG_SUBPLOT_SPP	24	Created date
CREATED_DATE	VEG_VISIT	16	Created date
CREATED_IN_INSTANCE	COND_DWM_CALC	99	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	LICHEN_LAB	14	Created in instance
CREATED_IN_INSTANCE	LICHEN_PLOT_SUMMARY	14	Created in instance
CREATED_IN_INSTANCE	LICHEN_SPECIES_SUMMARY	15	Created in instance
CREATED_IN_INSTANCE	LICHEN_VISIT	34	Created in instance
CREATED_IN_INSTANCE	OZONE_BIOSITE_SUMMARY	24	Created in instance
CREATED_IN_INSTANCE	OZONE_PLOT	21	Created in instance
CREATED_IN_INSTANCE	OZONE_PLOT_SUMMARY	24	Created in instance

Column name with (field guide section)	Table name	Location in table	Description
CREATED_IN_INSTANCE	OZONE_SPECIES_SUMMARY	32	Created in instance
CREATED_IN_INSTANCE	OZONE_VALIDATION	18	Created in instance
CREATED_IN_INSTANCE	OZONE_VISIT	25	Created in instance
CREATED_IN_INSTANCE	REF_LICHEN_SPECIES	10	Created in instance
CREATED_IN_INSTANCE	REF_LICHEN_SPP_COMMENTS	9	Created in instance
CREATED_IN_INSTANCE	REF_PLANT_DICTIONARY	36	Created in instance
CREATED_IN_INSTANCE	SOILS_EROSION	17	Created in instance
CREATED_IN_INSTANCE	SOILS_LAB	51	Created in instance
CREATED_IN_INSTANCE	SOILS_SAMPLE_LOC	27	Created in instance
CREATED_IN_INSTANCE	SOILS_VISIT	12	Created in instance
CREATED_IN_INSTANCE	VEG_PLOT_SPECIES	17	Created in instance
CREATED_IN_INSTANCE	VEG_QUADRAT	17	Created in instance
CREATED_IN_INSTANCE	VEG_SUBPLOT	32	Created in instance
CREATED_IN_INSTANCE	VEG_SUBPLOT_SPP	25	Created in instance
CREATED_IN_INSTANCE	VEG_VISIT	17	Created in instance
CRWTYP	DWM_VISIT	11	Crew type code
CRWTYP (20.4.6)	OZONE_VALIDATION	11	Crew type code
CRWTYP (20.4.6)	OZONE_VISIT	19	Crew type code
CRYPTO_CRUST_COVER_PCT (24.6.1)	VEG_SUBPLOT	17	Cryptobiotic crust cover percent
CTY_CN	OZONE_PLOT	3	County sequence number
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
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, adjusted
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

Column name with (field guide section)	Table name	Location in table	Description
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
CWDHSTCD (25.5.3.9)	DWM_COARSE_WOODY_DEBRIS	21	Coarse woody debris history code
CWDID	DWM_COARSE_WOODY_DEBRIS	9	Coarse woody debris piece (log) number
CYCLE	COND_DWM_CALC	103	Inventory cycle number
CYCLE	OZONE_PLOT	25	Inventory cycle number
DECAYCD (25.5.3.4)	DWM_COARSE_WOODY_DEBRIS	15	Decay class
DENSITY (25.9.11)	DWM_RESIDUAL_PILE	13	Packing ratio of pile (%)
DETAILED_NONFOREST_LAND_USE (24.4.5)	VEG_SUBPLOT	12	Detailed nonforest land use
DHRBCD (25.8.8)	DWM_MICROPLOT_FUEL	12	Dead herb cover (%)
DHRBHT (25.8.9)	DWM_MICROPLOT_FUEL	17	Dead herb height (ft)
DIVERSITY	LICHEN_PLOT_SUMMARY	11	Diversity
DPTHSSBSL (22.8.20)	SOILS_SAMPLE_LOC	23	Depth to a restricted layer
DRYBIO	DWM_COARSE_WOODY_DEBRIS	23	Dry biomass of the piece
DRYBIO	DWM_RESIDUAL_PILE	21	Dry biomass
DSHRBCD (25.8.4)	DWM_MICROPLOT_FUEL	10	Dead shrub cover (%)
DSHRBHT (25.8.5)	DWM_MICROPLOT_FUEL	15	Dead shrub height (ft)
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_DEPTH	COND_DWM_CALC	87	Average duff depth in the condition
DUFF_TC_ADJ	COND_DWM_CALC	95	Number of duff, litter, fuelbed sampling points on the entire plots, adjusted
DUFF_TC_COND	COND_DWM_CALC	93	Number of duff, litter, fuelbed sampling points in the condition
DUFF_TC_UNADJ	COND_DWM_CALC	94	Number of duff, litter, fuelbed sampling points on the entire plot, unadjusted
DUFFDEP (25.7.6)	DWM_DUFF_LITTER_FUEL	13	Depth of duff layer
DUMMY_SUBP_COVER_P RE2004	VEG_SUBPLOT_SPP	21	Dummy subplot cover for data prior to 2004
DURATION	REF_PLANT_DICTIONARY	11	Duration
ECEC	SOILS_LAB	34	Effective cation exchange capacity
ELEV	OZONE_PLOT_SUMMARY	11	Elevation
ELEV	OZONE_SPECIES_SUMMARY	22	Elevation
ELEVATION (20.4.16)	OZONE_PLOT	16	Elevation
EVALID	COND_DWM_CALC	8	Evaluation identifier
EVENNESS	LICHEN_PLOT_SUMMARY	10	Evenness
EXCHNG_AL	SOILS_LAB	33	Exchangeable aluminum

Column name with (field guide section)	Table name	Location in table	Description
EXCHNG_CA	SOILS_LAB	32	Exchangeable calcium
EXCHNG_CD	SOILS_LAB	40	Exchangeable cadmium
EXCHNG_CU	SOILS_LAB	38	Exchangeable copper
EXCHNG_FE	SOILS_LAB	36	Exchangeable iron
EXCHNG_K	SOILS_LAB	30	Exchangeable potassium
EXCHNG_MG	SOILS_LAB	31	Exchangeable magnesium
EXCHNG_MN	SOILS_LAB	35	Exchangeable manganese
EXCHNG_NA	SOILS_LAB	29	Exchangeable sodium
EXCHNG_NI	SOILS_LAB	37	Exchangeable nickel
EXCHNG_PB	SOILS_LAB	41	Exchangeable lead
EXCHNG_S	SOILS_LAB	42	Exchangeable sulfur
EXCHNG_ZN	SOILS_LAB	39	Exchangeable zinc
F	REF_PLANT_DICTIONARY	31	Forma indicator "f"
FAMILY	REF_PLANT_DICTIONARY	9	Family
FIELD_ID	OZONE_BIOSITE_SUMMARY	6	Field identification number
FIELD_ID	OZONE_PLOT	9	Field identification number
FIELD_ID	OZONE_PLOT_SUMMARY	6	Field identification number
FIELD_ID	OZONE_SPECIES_SUMMARY	6	Field identification number
FIELD_ID	OZONE_VALIDATION	7	Field identification number
FIELD_ID	OZONE_VISIT	7	Field identification number
FIELD_MOIST_SOIL_WT	SOILS_LAB	15	Field moist soil weight
FIELD_MOIST_WATER_CONTENT_PCT	SOILS_LAB	18	Field moist water content percent
FORFLTHK	SOILS_SAMPLE_LOC	9	Average forest floor thickness for the subplot
FORFLTHKE (22.8.13)	SOILS_SAMPLE_LOC	15	Forest floor thickness at the east edge of the sampling frame
FORFLTHKN (22.8.12)	SOILS_SAMPLE_LOC	11	Forest floor thickness at the north edge of the sampling frame
FORFLTHKS (22.8.14)	SOILS_SAMPLE_LOC	13	Forest floor thickness at the south edge of the sampling frame
FORFLTHKW (22.8.15)	SOILS_SAMPLE_LOC	17	Forest floor thickness at the west edge of the sampling frame
FORMA	REF_PLANT_DICTIONARY	32	Forma
FREQUENCY_PCT	LICHEN_SPECIES_SUMMARY	10	Frequency percent
FTRCD1 (21.3.25)	LICHEN_VISIT	21	Features code 1
FTRCD2 (21.3.25)	LICHEN_VISIT	22	Features code 2
FTRCD3 (21.3.5)	LICHEN_VISIT	23	Features code 3
FTRCD4 (21.3.25)	LICHEN_VISIT	24	Features code 4
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 (25.7.8)	DWM_DUFF_LITTER_FUEL	15	Depth of fuelbed (ft)
FWD_LG_CARBON_ADJ	COND_DWM_CALC	71	Large-size class fine woody debris carbon mass per acre, adjusted

<b>Column name with (field guide section)</b>	<b>Table name</b>	<b>Location in table</b>	<b>Description</b>
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_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_CNT_COND	COND_DWM_CALC	62	Large-size class fine woody debris pieces count in the condition
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
FWD_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
FWD_MD_DRYBIO_ADJ	COND_DWM_CALC	55	Medium-size class fine woody debris biomass per acre, adjusted

<b>Column name with (field guide section)</b>	<b>Table name</b>	<b>Location in table</b>	<b>Description</b>
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 class 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_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_CNT_COND	COND_DWM_CALC	36	Small-size class fine woody debris pieces count in the condition
FWD_SM_DRYBIO_ADJ	COND_DWM_CALC	42	Small-size class fine woody debris biomass per acre, adjusted
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
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

Column name with (field guide section)	Table name	Location in table	Description
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
GAPPCT (21.3.23.1)	LICHEN_VISIT	18	Gap percent
GAPRCNT (21.3.23.2)	LICHEN_VISIT	19	Gap recent percent
GENERA_BINOMIAL_AUTHOR	REF_PLANT_DICTIONARY	16	Genera binomial author
GENUS	LICHEN_SPECIES_SUMMARY	8	Genus
GENUS	REF_LICHEN_SPECIES	5	Genus
GENUS	REF_PLANT_DICTIONARY	20	Genus
GRIDDEN	OZONE_VISIT	22	Grid density
GROWTH_HABIT	REF_PLANT_DICTIONARY	10	Growth habit
GROUND_LOC_CD	OZONE_BIOSITE_SUMMARY	8	Ground location code
GROUND_LOC_CD	OZONE_SPECIES_SUMMARY	8	Ground location code
HEIGHT1 (25.9.9)	DWM_RESIDUAL_PILE	14	Pile height, first dimension (ft)
HEIGHT2 (25.9.10)	DWM_RESIDUAL_PILE	17	Pile height, second dimension (ft)
HOLLOWCD (25.5.3.8)	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 (25.4.6)	DWM_TRANSECT_SEGMENT	17	Ending horizontal distance of a coarse woody debris transect segment
HORIZ_LENGTH	DWM_TRANSECT_SEGMENT	15	Horizontal length
HRDWPCT (21.3.19)	LICHEN_VISIT	16	Percent hardwood
INJCHECK (20.4.15)	OZONE_VISIT	21	Injury check
INJVALID	OZONE_VALIDATION	13	Injury validation
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	LICHEN_LAB	3	Inventory year
INVYR	LICHEN_PLOT_SUMMARY	3	Inventory year
INVYR	LICHEN_SPECIES_SUMMARY	2	Inventory year

Column name with (field guide section)	Table name	Location in table	Description
INVYR	LICHEN_VISIT	3	Inventory year
INVYR	OZONE_BIOSITE_SUMMARY	2	Inventory year
INVYR	OZONE_PLOT	4	Inventory year
INVYR	OZONE_PLOT_SUMMARY	2	Inventory year
INVYR	OZONE_SPECIES_SUMMARY	2	Inventory year
INVYR	OZONE_VALIDATION	3	Inventory year
INVYR	OZONE_VISIT	3	Inventory year
INVYR	SOILS_EROSION	3	Inventory year
INVYR	SOILS_LAB	3	Inventory year
INVYR	SOILS_SAMPLE_LOC	3	Inventory year
INVYR	SOILS_VISIT	3	Inventory year
INVYR	VEG_PLOT_SPECIES	4	Inventory year
INVYR	VEG_QUADRAT	5	Inventory year
INVYR	VEG_SUBPLOT	4	Inventory year
INVYR	VEG_SUBPLOT_SPP	6	Inventory year
INVYR	VEG_VISIT	3	Inventory year
ISSUECD1 (21.3.26)	LICHEN_VISIT	25	Issues code 1
ISSUECD2 (21.3.26)	LICHEN_VISIT	26	Issues code 2
ISSUECD3 (21.3.26)	LICHEN_VISIT	27	Issues code 3
ISSUECD4 (21.3.26)	LICHEN_VISIT	28	Issues code 4
LAB_ID	SOILS_LAB	13	Laboratory identification
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_UNAJ	DWM_FINE_WOODY_DEBRIS	24	Large-size class transect length on plot, unadjusted
LARGECT (25.6.5)	DWM_FINE_WOODY_DEBRIS	13	Large-size class count
LARGEDIA (25.5.3.6.3)	DWM_COARSE_WOODY_DEBRIS	18	Large diameter
LAT	OZONE_PLOT	14	Fuzzed coordinates
LAT	OZONE_PLOT_SUMMARY	20	Fuzzed coordinates
LAYER_TYPE	SOILS_LAB	9	Layer type
LEAFVCHR	OZONE_VALIDATION	12	Leaf voucher
LENGTH (25.5.3.7)	DWM_COARSE_WOODY_DEBRIS	19	Length of the piece
LENGTH1 (25.9.5)	DWM_RESIDUAL_PILE	16	Pile length, first dimension (ft)
LENGTH2 (25.9.6)	DWM_RESIDUAL_PILE	19	Pile length, second dimension (ft)
LICH_SPPCD	LICHEN_LAB	7	Lichen species code
LICH_SPPCD	LICHEN_SPECIES_SUMMARY	4	Lichen species code
LICH_SPPCD	REF_LICHEN_SPECIES	1	Lichen species code
LICH_SPPCD	REF_LICHEN_SPP_COMMENTS	1	Lichen species code
LICHEN_COVER_PCT (24.6.2)	VEG_SUBPLOT	18	Lichen ground cover percent
LICHEN_REGION	LICHEN_SPECIES_SUMMARY	3	Lichen region
LICHEN_REGION_DESCR	LICHEN_SPECIES_SUMMARY	6	Lichen region description
LICHEN_STATCD (21.3.15)	LICHEN_VISIT	10	Lichens collected
LIPROJCD (21.3.10)	LICHEN_VISIT	11	Lichen project code
LITTDEP (14.6.7)	DWM_DUFF_LITTER_FUEL	14	Depth of litter layer (inches)

Column name with (field guide section)	Table name	Location in table	Description
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_DEPTH	COND_DWM_CALC	90	Average litter depth in the condition
LITTER_DUFF_COVER_P CT (24.6.3)	VEG_SUBPLOT	19	Litter/duff ground cover percent
LITTERCD (25.8.10)	DWM_MICROPLOT_FUEL	13	Litter code
LOCATION_CNT	OZONE_BIOSITE_SUMMARY	7	Location count
LOGS_AC_COND	DWM_COARSE_WOODY_DEBRIS	28	Logs per acre on a condition for condition-level estimates, core design
LOGS_AC_COND_P2	DWM_COARSE_WOODY_DEBRIS	28	Logs per acre on a condition for P2 regional designs
LOGS_AC_PLOT	DWM_COARSE_WOODY_DEBRIS	27	Logs per acre on the plot, for plot-level estimates, core designs
LOGS_AC_PLOT_P2	DWM_COARSE_WOODY_DEBRIS	30	Logs per acre on the plot for P2 regional designs
LOGS_AC_UNADJ	DWM_COARSE_WOODY_DEBRIS	26	Logs per acre unadjusted, for population estimates, core design
LOGS_AC_UNADJ_P2	DWM_COARSE_WOODY_DEBRIS	29	Logs per acre unadjusted, for P2 regional designs
LON	OZONE_PLOT	15	Fuzzed coordinates
LON	OZONE_PLOT_SUMMARY	21	Fuzzed coordinates
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 (pieces) per acre, unadjusted, national core design
LPA_UNADJ_RGN	DWM_COARSE_WOODY_DEBRIS	29	Number of logs (pieces) per acre, unadjusted, regional design
LTRLRTHK	SOILS_SAMPLE_LOC	10	Average litter layer thickness for the subplot
LTRLRTHKE (22.8.17)	SOILS_SAMPLE_LOC	16	Litter layer thickness at the east edge of the sampling frame
LTRLRTHKN (22.8.16)	SOILS_SAMPLE_LOC	12	Litter layer thickness at the north edge of the sampling frame

Column name with (field guide section)	Table name	Location in table	Description
LTRLRTHKS (22.8.18)	SOILS_SAMPLE_LOC	14	Litter layer thickness at the south edge of the sampling frame
LTRLRTHKW (22.8.19)	SOILS_SAMPLE_LOC	18	Litter layer thickness at the west edge of the sampling frame
LVHRBCD (25.8.6)	DWM_MICROPLOT_FUEL	11	Live herb cover (percent)
LVHRBHT (25.8.7)	DWM_MICROPLOT_FUEL	16	Live herb height (ft)
LVSHRBCD (25.8.2)	DWM_MICROPLOT_FUEL	9	Live shrub cover (percent)
LVSHRBHT (25.8.3)	DWM_MICROPLOT_FUEL	14	Live shrub height (ft)
MANUAL	OZONE_PLOT	17	Field guide (manual) version number
MAX_COVER_LAYER_NBR_PRE2004	VEG_SUBPLOT_SPP	22	Maximum cover layer number for data collected prior to 2004
MEASDAY	DWM_VISIT	7	Measurement day
MEASDAY (21.3.9)	LICHEN_VISIT	7	Measurement day
MEASDAY (20.4.8.3)	OZONE_PLOT	13	Measurement day
MEASDAY (20.4.8.3)	OZONE_VISIT	10	Measurement day
MEASDAY (22.6.1.3)	SOILS_VISIT	7	Measurement day
MEASMON	DWM_VISIT	8	Measurement month
MEASMON (21.3.8)	LICHEN_VISIT	8	Measurement month
MEASMON (20.4.8.2)	OZONE_PLOT	12	Measurement month
MEASMON (20.4.8.2)	OZONE_VISIT	11	Measurement month
MEASMON (22.6.1.2)	SOILS_VISIT	8	Measurement month
MEASYEAR	COND_DWM_CALC	5	Measurement year
MEASYEAR	DWM_COARSE_WOODY_DEBRIS	10	Measurement year
MEASYEAR	DWM_DUFF_LITTER_FUEL	11	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 (21.3.7)	LICHEN_LAB	8	Measurement year
MEASYEAR (21.3.7)	LICHEN_PLOT_SUMMARY	7	Measurement year
MEASYEAR (21.3.7)	LICHEN_SPECIES_SUMMARY	5	Measurement year
MEASYEAR (21.3.7)	LICHEN_VISIT	9	Measurement year
MEASYEAR (20.4.8.1)	OZONE_BIOSITE_SUMMARY	9	Measurement year
MEASYEAR (20.4.8.1)	OZONE_PLOT	11	Measurement year
MEASYEAR (20.4.8.1)	OZONE_PLOT_SUMMARY	8	Measurement year
MEASYEAR (20.4.8.1)	OZONE_SPECIES_SUMMARY	9	Measurement year
MEASYEAR (20.4.8.1)	OZONE_VALIDATION	15	Measurement year
MEASYEAR (20.4.8.1)	OZONE_VISIT	12	Measurement year
MEASYEAR (22.6.1.1)	SOILS_EROSION	8	Measurement year
MEASYEAR (22.6.1.1)	SOILS_LAB	45	Measurement year
MEASYEAR (22.6.1.1)	SOILS_SAMPLE_LOC	8	Measurement year
MEASYEAR (22.6.1.1)	SOILS_VISIT	9	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

Column name with (field guide section)	Table name	Location in table	Description
MEDIUM_TL_UNAJ	DWM_FINE_WOODY_DEBRIS	21	Medium-size transect length on plot, unadjusted
MEDIUMCT	DWM_FINE_WOODY_DEBRIS	12	Medium-size class count
MINERAL_SOIL_COVER_PCT (24.6.4)	VEG_SUBPLOT	20	Mineral soil ground cover percent
MODIFIED_BY	COND_DWM_CALC	100	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	LICHEN_LAB	15	Modified by
MODIFIED_BY	LICHEN_PLOT_SUMMARY	15	Modified by
MODIFIED_BY	LICHEN_SPECIES_SUMMARY	16	Modified by
MODIFIED_BY	LICHEN_VISIT	35	Modified by
MODIFIED_BY	OZONE_BIOSITE_SUMMARY	25	Modified by
MODIFIED_BY	OZONE_PLOT	22	Modified by
MODIFIED_BY	OZONE_PLOT_SUMMARY	25	Modified by
MODIFIED_BY	OZONE_SPECIES_SUMMARY	33	Modified by
MODIFIED_BY	OZONE_VALIDATION	19	Modified by
MODIFIED_BY	OZONE_VISIT	26	Modified by
MODIFIED_BY	REF_LICHEN_SPECIES	11	Modified by
MODIFIED_BY	REF_LICHEN_SPP_COMMENTS	10	Modified by
MODIFIED_BY	REF_PLANT_DICTIONARY	37	Modified by
MODIFIED_BY	SOILS_EROSION	18	Modified by
MODIFIED_BY	SOILS_LAB	46	Modified by
MODIFIED_BY	SOILS_SAMPLE_LOC	28	Modified by
MODIFIED_BY	SOILS_VISIT	13	Modified by
MODIFIED_BY	VEG_PLOT_SPECIES	18	Modified by
MODIFIED_BY	VEG_QUADRAT	18	Modified by
MODIFIED_BY	VEG_SUBPLOT	33	Modified by
MODIFIED_BY	VEG_SUBPLOT_SPP	26	Modified by
MODIFIED_BY	VEG_VISIT	18	Modified by
MODIFIED_DATE	COND_DWM_CALC	102	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	LICHEN_LAB	16	Modified date
MODIFIED_DATE	LICHEN_PLOT_SUMMARY	16	Modified date
MODIFIED_DATE	LICHEN_SPECIES_SUMMARY	17	Modified date
MODIFIED_DATE	LICHEN_VISIT	36	Modified date
MODIFIED_DATE	OZONE_BIOSITE_SUMMARY	26	Modified date
MODIFIED_DATE	OZONE_PLOT	23	Modified date
MODIFIED_DATE	OZONE_PLOT_SUMMARY	26	Modified date
MODIFIED_DATE	OZONE_SPECIES_SUMMARY	34	Modified date

Column name with (field guide section)	Table name	Location in table	Description
MODIFIED_DATE	OZONE_VALIDATION	20	Modified date
MODIFIED_DATE	OZONE_VISIT	27	Modified date
MODIFIED_DATE	REF_LICHEN_SPECIES	12	Modified date
MODIFIED_DATE	REF_LICHEN_SPP_COMMENTS	11	Modified date
MODIFIED_DATE	REF_PLANT_DICTIONARY	38	Modified date
MODIFIED_DATE	SOILS_EROSION	19	Modified date
MODIFIED_DATE	SOILS_LAB	47	Modified date
MODIFIED_DATE	SOILS_SAMPLE_LOC	29	Modified date
MODIFIED_DATE	SOILS_VISIT	14	Modified date
MODIFIED_DATE	VEG_PLOT_SPECIES	19	Modified date
MODIFIED_DATE	VEG_QUADRAT	19	Modified date
MODIFIED_DATE	VEG_SUBPLOT	34	Modified date
MODIFIED_DATE	VEG_SUBPLOT_SPP	27	Modified date
MODIFIED_DATE	VEG_VISIT	19	Modified date
MODIFIED_IN_INSTANCE	COND_DWM_CALC	101	Modified in instance
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	LICHEN_LAB	17	Modified in instance
MODIFIED_IN_INSTANCE	LICHEN_PLOT_SUMMARY	17	Modified in instance
MODIFIED_IN_INSTANCE	LICHEN_SPECIES_SUMMARY	18	Modified in instance
MODIFIED_IN_INSTANCE	LICHEN_VISIT	37	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_BIOSITE_SUMMARY	27	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_PLOT	24	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_PLOT_SUMMARY	27	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_SPECIES_SUMMARY	35	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_VALIDATION	21	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_VISIT	28	Modified in instance
MODIFIED_IN_INSTANCE	REF_LICHEN_SPECIES	13	Modified in instance
MODIFIED_IN_INSTANCE	REF_PLANT_DICTIONARY	39	Modified in instance
MODIFIED_IN_INSTANCE	REF_LICHEN_SPP_COMMENTS	12	Modified in instance
MODIFIED_IN_INSTANCE	SOILS_EROSION	20	Modified in instance
MODIFIED_IN_INSTANCE	SOILS_LAB	48	Modified in instance
MODIFIED_IN_INSTANCE	SOILS_SAMPLE_LOC	30	Modified in instance
MODIFIED_IN_INSTANCE	SOILS_VISIT	15	Modified in instance
MODIFIED_IN_INSTANCE	VEG_PLOT_SPECIES	20	Modified in instance
MODIFIED_IN_INSTANCE	VEG_QUADRAT	20	Modified in instance
MODIFIED_IN_INSTANCE	VEG_SUBPLOT	35	Modified in instance
MODIFIED_IN_INSTANCE	VEG_SUBPLOT_SPP	28	Modified in instance
MODIFIED_IN_INSTANCE	VEG_VISIT	20	Modified in instance
MOSS_COVER_PCT (24.6.5)	VEG_SUBPLOT	21	Moss ground cover percent
N_TOTAL_PCT	SOILS_LAB	26	Nitrogen total percent
NEW_SCIENTIFIC_NAME	REF_PLANT_DICTIONARY	6	New scientific name
NEW_SYMBOL	REF_PLANT_DICTIONARY	5	New symbol
NOTES	REF_PLANT_DICTIONARY	33	Notes
O3_STATCD	OZONE_VALIDATION	14	Ozone status code
O3PLOT (20.4.4)	OZONE_BIOSITE_SUMMARY	5	Ozone plot

Column name with (field guide section)	Table name	Location in table	Description
O3PLOT (20.4.4)	OZONE_PLOT	8	Ozone plot
O3PLOT (20.4.4)	OZONE_PLOT_SUMMARY	5	Ozone plot
O3PLOT (20.4.4)	OZONE_SPECIES_SUMMARY	5	Ozone plot
O3PLOT (20.4.4)	OZONE_VALIDATION	6	Ozone plot
O3PLOT (20.4.4)	OZONE_VISIT	6	Ozone plot
OLSEN_P	SOILS_LAB	44	Olsen phosphorus
ORIGIN_FLAG	LICHEN_LAB	10	Origin flag
ORNTCD_PNWRS	DWM_COARSE_WOODY_DEBRIS	34	Orientation code, Pacific Northwest Research Station
OVEN_DRY_SOIL_WT	SOILS_LAB	17	Ovendry soil weight
PH_CACL2	SOILS_LAB	28	pH measured in calcium chloride
PH_H2O	SOILS_LAB	27	pH measured in water
PHASE	COND_DWM_CALC	12	Phase
PILE (25.9.1)	DWM_RESIDUAL_PILE	8	Subplot 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_UNADJ	COND_DWM_CALC	82	Carbon mass per acre of piles, for population estimates, unadjusted
PILE_DRYBIO_ADJ	COND_DWM_CALC	79	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
PILE_SAMPLE_AREA_COND	COND_DWM_CALC	72	Condition area sampled for piles
PILE_SAMPLE_AREA_UNADJ	COND_DWM_CALC	73	Plot area sampled for piles, in all conditions, unadjusted
PILE_COLCF_ADJ	COND_DWM_CALC	77	Cubic foot volume per acre of piles, for population estimates, adjusted
PILE_VOLCF_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
PILES_AC_COND	DWM_RESIDUAL_PILE	25	Piles per acre on a condition
PILES_AC_PLOT	DWM_RESIDUAL_PILE	24	Piles per acre on a plot
PILES_AC_UNSDJ	DWM_RESIDUAL_PILE	23	Piles per acre, for population estimates, unadjusted
PILESCD	DWM_FINE_WOODY_DEBRIS	15	Pile code
PLANT_EVAL_CNT	OZONE_BIOSITE_SUMMARY	11	Plant evaluation count

Column name with (field guide section)	Table name	Location in table	Description
PLANT_EVAL_CNT	OZONE_SPECIES_SUMMARY	18	Plant evaluation count
PLANT_INJ_CNT	OZONE_BIOSITE_SUMMARY	10	Plant injury count
PLANT_INJ_CNT	OZONE_SPECIES_SUMMARY	17	Plant injury count
PLANT_RATIO	OZONE_BIOSITE_SUMMARY	12	Plant ratio
PLANT_RATIO	OZONE_SPECIES_SUMMARY	19	Plant ratio
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 (21.3.3)	LICHEN_LAB	6	Phase 2 plot number
PLOT (21.3.3)	LICHEN_PLOT_SUMMARY	6	Phase 2 plot number
PLOT (21.3.3)	LICHEN_VISIT	6	Phase 2 plot number
PLOT	SOILS_EROSION	6	Phase 2 plot number
PLOT	SOILS_LAB	6	Phase 2 plot number
PLOT	SOILS_SAMPLE_LOC	6	Phase 2 plot number
PLOT	SOILS_VISIT	6	Phase 2 plot number
PLOT (24.3.3)	VEG_PLOT_SPECIES	7	Phase 2 plot number
PLOT (24.3.3)	VEG_QUADRAT	8	Phase 2 plot number
PLOT (24.3.3)	VEG_SUBPLOT	7	Phase 2 plot number
PLOT (24.3.3)	VEG_SUBPLOT_SPP	9	Phase 2 plot number
PLOT (24.3.3)	VEG_VISIT	6	Phase 2 plot number
PLOTS_IN_REGION	LICHEN_SPECIES_SUMMARY	12	Plots in region (number)
PLOTWET (20.4.13)	OZONE_PLOT_SUMMARY	17	Plot wetness
PLOTWET (20.4.13)	OZONE_SPECIES_SUMMARY	28	Plot wetness
PLOTWET (20.4.13)	OZONE_VISIT	20	Plot wetness
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
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	LICHEN_LAB	2	Plot sequence number
PLT_CN	LICHEN_PLOT_SUMMARY	2	Plot sequence number
PLT_CN	LICHEN_VISIT	2	Plot sequence number
PLT_CN	OZONE_VALIDATION	2	Plot sequence number
PLT_CN	OZONE_VISIT	2	Plot sequence number
PLT_CN	SOILS_EROSION	2	Plot sequence number
PLT_CN	SOILS_LAB	2	Plot sequence number
PLT_CN	SOILS_SAMPLE_LOC	2	Plot sequence number
PLT_CN	SOILS_VISIT	2	Plot sequence number
PLT_CN	VEG_PLOT_SPECIES	2	Plot sequence number
PLT_CN	VEG_QUADRAT	2	Plot sequence number
PLT_CN	VEG_SUBPLOT	2	Plot sequence number
PLT_CN	VEG_SUBPLOT_SPP	2	Plot sequence number
PLT_CN	VEG_VISIT	2	Plot sequence number

Column name with (field guide section)	Table name	Location in table	Description
PLTDSTRB (20.4.14)	OZONE_PLOT_SUMMARY	18	Plot disturbance
PLTDSTRB (20.4.14)	OZONE_SPECIES_SUMMARY	29	Plot disturbance
PLTDSTRB (20.4.14)	OZONE_VISIT	18	Plot disturbance
PLTSIZE (20.4.9)	OZONE_PLOT_SUMMARY	12	Plot size
PLTSIZE (20.4.9)	OZONE_SPECIES_SUMMARY	23	Plot size
PLTSIZE (20.4.9)	OZONE_VISIT	13	Plot size
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
QA_STATUS (20.4.5)	OZONE_PLOT	18	Quality assurance status
QASTATCD	DWM_VISIT	10	Quality assurance status code
QASTATCD	OZONE_VALIDATION	10	Quality assurance status code
QASTATCD	SOILS_LAB	11	Quality assurance status code
QUAD_1_PRESENCE	VEG_SUBPLOT_SPP	18	Presence of species on quadrat 1 of current subplot
QUAD_2_PRESENCE	VEG_SUBPLOT_SPP	19	Presence of species on quadrat 2 of current subplot
QUAD_3_PRESENCE	VEG_SUBPLOT_SPP	20	Presence of species on quadrat 3 of current subplot
QUADRAT (24.7.2)	VEG_QUADRAT	10	Quadrat number
QUADRAT_STATUS (24.7.4)	VEG_QUADRAT	12	Quadrat status code
QUADRAT_STATUS_PRE2004	VEG_QUADRAT	13	Quadrat status of quadrats sampled before 2004
QUADINOMIAL_AUTHOR	REF_PLANT_DICTIONARY	18	Quadrinomial author
RESIDUAL_WATER_CONTENT_PCT	SOILS_LAB	19	Residual water content percent
RICHNESS	LICHEN_PLOT_SUMMARY	9	Richness
ROAD_TRAIL_COVER_PCT (24.6.6)	VEG_SUBPLOT	22	Road/trail ground cover percent
ROCK_COVER_PCT (24.6.7)	VEG_SUBPLOT	23	Rock ground cover percent
RSCD	COND_DWM_CALC	106	Region or station code
RSNCTCD (14.5.6)	DWM_FINE_WOODY_DEBRIS	14	Reason high tally code
SAMPLE_DATE	SOILS_LAB	12	Sample date
SAMPLE_ID	SOILS_LAB	14	Sample identification
SAMPLER_TYPE	SOILS_LAB	10	Sampler type
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
SFTWDPCT (21.3.18)	LICHEN_VISIT	15	Softwood percent (percent conifers)
SHAPECD	DWM_RESIDUAL_PILE	11	Pile shape code
SHRUBPCT (21.3.20)	LICHEN_VISIT	17	Percent shrub
SLOPDIST (25.5.3.3)	DWM_COARSE_WOODY_DEBRIS	12	Slope distance
SLOPE (25.4.5)	DWM_TRANSECT_SEGMENT	14	Segment slope (%)
SLOPE_BEGNDIST	DWM_TRANSECT_SEGMENT	12	Beginning clope distance
SLOPE_ENDDIST	DWM_TRANSECT_SEGMENT	13	Ending slope distance

Column name with (field guide section)	Table name	Location in table	Description
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_UNAJ	DWM_FINE_WOODY_DEBRIS	18	Small-size class transect length on plot, unadjusted
SMALLCT (25.6.3)	DWM_FINE_WOODY_DEBRIS	11	Small-size class count
SMALLDIA (25.5.3.6.2)	DWM_COARSE_WOODY_DEBRIS	17	Small diameter
SMPKNDCD	DWM_VISIT	12	Sample kind code
SMPKNDCD (20.4.7)	OZONE_VISIT	9	Ozone sample kind code
SMPLDCD (25.7.5)	DWM_DUFF_LITTER_FUEL	12	Sampled Code
SMPLNNBR	SOILS_LAB	7	Sample line number
SMPLNNBR	SOILS_SAMPLE_LOC	7	Sample line number
SMPLOCCD	DWM_DUFF_LITTER_FUEL	9	Sample location code
SMPLSTP (21.3.17)	LICHEN_VISIT	13	Sample stop time
SMPLSTRT (21.3.16)	LICHEN_VISIT	12	Sample start time
SMPLTIME	LICHEN_VISIT	14	Total sample time
SOILDPH (20.4.12)	OZONE_PLOT_SUMMARY	15	Soil depth
SOILDPH (20.4.12)	OZONE_SPECIES_SUMMARY	26	Soil depth
SOILDPH (20.4.12)	OZONE_VISIT	16	Soil depth
SOILDRN (20.4.13)	OZONE_PLOT_SUMMARY	16	Soil drainage
SOILDRN (20.4.13)	OZONE_SPECIES_SUMMARY	27	Soil drainage
SOILDRN (20.4.13)	OZONE_VISIT	17	Soil drainage
SOILS_STATCD (22.8.10)	SOILS_SAMPLE_LOC	24	Soil sampling status code
SOILSPCT (22.7.1)	SOILS_EROSION	9	Soils percent (percent bare soil)
SP_CANOPY_COVER_LAYER_1_2	VEG_SUBPLOT_SPP	15	Species canopy cover layer 1 and 2 percent
SP_CANOPY_COVER_LAYER_3	VEG_SUBPLOT_SPP	16	Species canopy cover layer 3
SP_CANOPY_COVER_LAYER_4	VEG_SUBPLOT_SPP	17	Species canopy cover layer 4
SP_CANOPY_COVER_TOTAL	VEG_SUBPLOT_SPP	14	Total species canopy cover percent
SPCD (25.5.3.5)	DWM_COARSE_WOODY_DEBRIS	14	Species code
SPECIES	LICHEN_SPECIES_SUMMARY	11	Species
SPECIES	REF_LICHEN_SPECIES	6	Species
SPECIES	REF_PLANT_DICTIONARY	22	Species
SPECIES_EVAL_CNT	OZONE_BIOSITE_SUMMARY	13	Species evaluation count
SPECIES_EVAL_CNT	OZONE_PLOT_SUMMARY	9	Species evaluation count
SPECIMEN_COLLECTED (24.8.1.3)	VEG_PLOT_SPECIES	11	Specimen officially collected
SPECIMEN_LABEL_NBR (24.8.1.4)	VEG_PLOT_SPECIES	12	Specimen label number for unknown specimen collected
SPECIMEN_NOT_COLLECTED_REASON (24.8.1.5)	VEG_PLOT_SPECIES	13	Specimen not collected reason
SPECIMEN_RESOLVED	VEG_PLOT_SPECIES	14	Specimen resolved
SPLIT_PLOTID	OZONE_PLOT	10	Split plot identification
SPLIT_PLOTID	OZONE_PLOT_SUMMARY	7	Split plot identification
SPLIT_PLOTID	OZONE_SPECIES_SUMMARY	7	Split plot identification
SPLIT_PLOTID	OZONE_VALIDATION	8	Split plot identification

Column name with (field guide section)	Table name	Location in table	Description
SPLIT_PLOTID	OZONE_VISIT	8	Split plot identification
SPP_ACRONYM	LICHEN_SPECIES_SUMMARY	7	Species acronym
SPP_ACRONYM	REF_LICHEN_SPECIES	4	Species acronym
SPP_COMMENTS	LICHEN_LAB	11	Species comments
SPP_COMMENTS	REF_LICHEN_SPP_COMMENTS	5	Species comments
SPP_NAME	REF_LICHEN_SPP_COMMENTS	2	Species name
SRV_CN	OZONE_PLOT	2	Survey sequence number
SSP	REF_PLANT_DICTIONARY	23	Subspecies indicator “ssp”
STANDING_WATER_COVER_PCT (24.6.8)	VEG_SUBPLOT	24	Standing water/flooded ground cover percent
STATE_AND PROVINCE	REF_PLANT_DICTIONARY	14	State and province
STATE_DISTRIBUTION	REF_PLANT_DICTIONARY	13	State distribution
STATECD	COND_DWM_CALC	2	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 (21.3.4)	LICHEN_LAB	4	State code
STATECD (21.3.4)	LICHEN_PLOT_SUMMARY	4	State code
STATECD (21.3.4)	LICHEN_VISIT	4	State code
STATECD (20.4.1)	OZONE_BIOSITE_SUMMARY	3	State code
STATECD (20.4.1)	OZONE_PLOT	5	State code
STATECD (20.4.1)	OZONE_PLOT_SUMMARY	3	State code
STATECD (20.4.1)	OZONE_SPECIES_SUMMARY	3	State code
STATECD (20.4.1)	OZONE_VALIDATION	4	State code
STATECD (20.4.1)	OZONE_VISIT	4	State code
STATE CD	SOILS_EROSION	4	State code
STATECD	SOILS_LAB	4	State code
STATECD	SOILS_SAMPLE_LOC	4	State code
STATECD	SOILS_VISIT	4	State code
STATECD (24.3.1)	VEG_PLOT_SPECIES	5	State code
STATECD (24.3.1)	VEG_QUADRAT	6	State code
STATECD (24.3.1)	VEG_SUBPLOT	5	State code
STATECD (24.3.1)	VEG_SUBPLOT_SPP	7	State code
STATECD (24.3.1)	VEG_VISIT	4	State code
STRATUM_CN	COND_DWM_CALC	11	Stratum sequence number
STREAM_LAKE_COVER_PCT (24.6.9)	VEG_SUBPLOT	25	Stream and lake ground cover percent
SUBCYCLE	OZONE_PLOT	26	Subcycle number
SUBP (25.5.3.1)	DWM_COARSE_WOODY_DEBRIS	7	Subplot number
SUBP (25.7.3)	DWM_DUFF_LITTER_FUEL	8	Subplot number
SUBP (25.6.1)	DWM_FINE_WOODY_DEBRIS	8	Subplot number
SUBP (25.8.1)	DWM_MICROPLOT_FUEL	7	Subplot number
SUBP (25.9.1)	DWM_RESIDUAL_PILE	7	Subplot number
SUBP (25.4.1)	DWM_TRANSECT_SEGMENT	7	Subplot number
SUBP (24.7.1)	VEG_QUADRAT	9	Subplot number
SUBP	SOILS_EROSION	7	Subplot number
SUBP (24.4.1)	VEG_SUBPLOT	8	Subplot number

Column name with (field guide section)	Table name	Location in table	Description
SUBP	VEG_SUBPLOT_SPP	10	Subplot number
SUBP_ACCESSIBLE_FOREST_PCT (24.4.4)	VEG_SUBPLOT	11	Subplot accessible forest percent
SUBSPECIES	REF_PLANT_DICTIONARY	25	Subspecies
SUM_ABUNDANCE	LICHEN_SPECIES_SUMMARY	9	Sum of abundance
SUBCYCLE	COND_DWM_CALC	104	Inventory subcycle
SUBVAR	REF_PLANT_DICTIONARY	29	Subspecies indicator "subvar"
SUBVARIETY	REF_PLANT_DICTIONARY	30	Subvariety
SUMMATION	LICHEN_PLOT_SUMMARY	8	Summation
SVRTY_CLASS_FIVE	OZONE_BIOSITE_SUMMARY	21	Severity class five
SVRTY_CLASS_FOUR	OZONE_BIOSITE_SUMMARY	20	Severity class four
SVRTY_CLASS_ONE	OZONE_BIOSITE_SUMMARY	17	Severity class one
SVRTY_CLASS_THREE	OZONE_BIOSITE_SUMMARY	19	Severity class three
SVRTY_CLASS_TWO	OZONE_BIOSITE_SUMMARY	18	Severity class two
SVRTY_CLASS_ZERO	OZONE_BIOSITE_SUMMARY	16	Severity class zero
SVRTY_MAX	OZONE_SPECIES_SUMMARY	14	Severity maximum
SVRTY_MEAN	OZONE_SPECIES_SUMMARY	16	Severity mean
SVRTY_MIN	OZONE_SPECIES_SUMMARY	15	Severity minimum
SYMBOL	REF_PLANT_DICTIONARY	3	Symbol
SYMBOL_TYPE	REF_PLANT_DICTIONARY	2	Symbol type
SZCLSCD1 (21.3.24)	LICHEN_VISIT	29	Size class code
SZCLSCD2 (21.3.24)	LICHEN_VISIT	30	Size class code
SZCLSCD3 (21.3.24)	LICHEN_VISIT	31	Size class code
TALLSHRB (21.3.23.3)	LICHEN_VISIT	20	Tall shrubs
TERRPOS (20.4.11)	OZONE_PLOT_SUMMARY	14	Terrain position
TERRPOS (20.4.11)	OZONE_SPECIES_SUMMARY	25	Terrain position
TERRPOS (20.4.11)	OZONE_VISIT	15	Terrain position
TRINOMIAL_AUTHOR	REF_PLANT_DICTIONARY	17	Trinomial author
TOTAL_CANOPY_COVER_LAYER_1 (24.5.1)	VEG_SUBPLOT	13	Total canopy cover layer 1
TOTAL_CANOPY_COVER_LAYER_2 (24.5.2)	VEG_SUBPLOT	14	Total canopy cover layer 2
TOTAL_CANOPY_COVER_LAYER_3 (24.5.3)	VEG_SUBPLOT	15	Total canopy cover layer 3
TOTAL_CANOPY_COVER_LAYER_4 (24.5.4)	VEG_SUBPLOT	16	Total canopy cover layer 4
TOTAL_WATER_CONTENT_PCT	SOILS_LAB	20	Total water content percent
TRACE_COVER_ALLOWED	VEG_VISIT	10	Trace cover allowed
TRAMPLING	VEG_QUADRAT	14	Trampling code
TRANSDIA (25.5.3.6.1)	DWM_COARSE_WOODY_DEBRIS	16	Transect diameter
TRANSECT (25.5.3.2)	DWM_COARSE_WOODY_DEBRIS	8	Subplot transect (deg)
TRANSECT (25.7.4)	DWM_DUFF_LITTER_FUEL	7	Subplot transect (deg)
TRANSECT	DWM_FINE_WOODY_DEBRIS	7	Subplot transect (deg)
TRANSECT (25.4.2)	DWM_TRANSECT_SEGMENT	8	Subplot transect (deg)
TRASH_JUNK_COVER_PCT (24.6.10)	VEG_SUBPLOT	26	Trash/junk/other ground cover percent
TXTRLYR1 (22.8.21)	SOILS_SAMPLE_LOC	21	Soil texture layer 1
TXTRLYR2 (22.6.22)	SOILS_SAMPLE_LOC	22	Soil texture layer 2

Column name with (field guide section)	Table name	Location in table	Description
TYPAREACD (22.7.5)	SOILS_EROSION	13	Type compacted area code
TYPCMPCD (22.7.4)	SOILS_EROSION	12	Type compacted trail code
TYPOTHRCD (22.7.6)	SOILS_EROSION	14	Type other type of compaction code
TYPRTDCD (22.7.3)	SOILS_EROSION	11	Type rutted trail code
UNIQUE_SP_NBR (24.8.1.2)	VEG_PLOT_SPECIES	9	Unique species number
UNIQUE_SP_NBR (24.8.1.2)	VEG_SUBPLOT_SPP	12	Unique species number
UNITCD	COND_DWM_CALC	105	Survey unit code
UNITCD	OZONE_PLOT	6	Unit code
US_NATIVITY	REF_PLANT_DICTIONARY	12	United States nativity
VAR	REF_PLANT_DICTIONARY	26	Variety indicator "var"
VARIETY	REF_PLANT_DICTIONARY	28	Variety
VEG_FLDSPCD (24.8.1.1)	VEG_PLOT_SPECIES	8	Vegetation field species code
VEG_FLDSPCD (24.8.1.1)	VEG_SUBPLOT_SPP	11	Vegetation field species code
VEG_KINDCD	VEG_VISIT	8	Vegetation sample kind code
VEG_MANUAL	VEG_VISIT	9	Vegetation manual (field guide version number)
VEG_MEASDAY	VEG_VISIT	13	Vegetation measurement day
VEG_MEASMON	VEG_VISIT	12	Vegetation measurement month
VEG_MEASYEAR	VEG_VISIT	11	Vegetation measurement year
VEG_QA_STATUS (24.3.4)	VEG_VISIT	7	Vegetation quality assurance status code
VEG_SAMPLE_BASIS	VEG_VISIT	14	Vegetation sample basis
VEG_SPCD	VEG_PLOT_SPECIES	10	Vegetation species code
VEG_SPCD	VEG_SUBPLOT_SPP	13	Vegetation species code
VEG_SUBP_NONSAMPLE	VEG_SUBPLOT	10	Vegetation subplot
REASN_CD (24.4.3)			nonsampled reason code
VEG_SUBP_NONSMP_RSN_CD_PRE2004	VEG_SUBPLOT	29	Vegetation subplot nonsampled reason code, prior to 2004
VEG_SUBP_STATUS_CD (24.4.2)	VEG_SUBPLOT	9	Vegetation subplot status code
VEG_SUBP_STATUS_CD_PRE2004	VEG_SUBPLOT	28	Vegetation subplot status code, prior to 2004
VOLCF	DWM_COARSE_WOODY_DEBRIS	22	Cubic foot volume of the piece
VOLCF	DWM_RESIDUAL_PILE	20	Gross cubic foot volume
VPS_CN	VEG_SUBPLOT_SPP	5	Vegetation plot species sequence number
VSB_CN	VEG_QUADRAT	4	Vegetation subplot sequence number
VSB_CN	VEG_SUBPLOT_SPP	4	Vegetation subplot sequence number
VSTNBR (22.8.9)	SOILS_LAB	8	Visit number
VSTNBR (22.8.9)	SOILS_SAMPLE_LOC	20	Visit Number
VVT_CN	VEG_PLOT_SPECIES	3	Vegetation visit sequence number
VVT_CN	VEG_QUADRAT	3	Vegetation visit sequence number

<b>Column name with (field guide section)</b>	<b>Table name</b>	<b>Location in table</b>	<b>Description</b>
VVT_CN	VEG_SUBPLOT	3	Vegetation visit sequence number
VVT_CN	VEG_SUBPLOT_SPP	3	Vegetation visit sequence number
WIDTH1 (25.9.7)	DWM_RESIDUAL_PILE	15	Pile width, first dimension (ft)
WIDTH2 (25.9.8)	DWM_RESIDUAL_PILE	18	Pile width, second dimension (ft)
WOOD_COVER_PCT	VEG_SUBPLOT	27	Wood ground cover percent
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
YEAREND	REF_LICHEN_SPECIES	3	Year end
YEAREND	REF_LICHEN_SPP_COMMENTS	3	Year end
YEARSTART	REF_LICHEN_SPECIES	2	Year start
YEARSTART	REF_LICHEN_SPP_COMMENTS	4	Year start