The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0
(Phase 3 Indicators)

Forest Inventory and Analysis Program
U.S. Department of Agriculture, Forest Service

Chapter 1 -- Introduction

This manual is the definitive guide to the Forest Inventory and Analysis database (FIADB) for phase 3 (P3) indicators. This document is a companion to "The Forest Inventory and Analysis Database: Database Description and Users Manual, Version 3.0 for Phase 2". 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 what may be characterized as a three-phase sampling scheme. Phase 1 (P1) is used for stratification, while phase 2 (P2) consists of plots that are visited or photo-interpreted. A subset of phase 2 plots are designated as phase 3 (P3) plots, 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 user's manual (U.S. Department of Agriculture, Forest Service in review). The exception is phase 3 crown attributes, which are described in the TREE table of the phase 2 document (available online at www.fia.fs.fed.us.)

Although the FIADB is used widely within the Forest Inventory and Analysis (FIA) program, a substantial part, if not the majority, of the intended audience includes those outside FIA who are interested in using FIA data for their own analyses. Awareness of the potential uses of FIA data by users outside the FIA community is growing, and the data become increasingly useful as additional data are collected. However, as is the case with any data source, it is incumbent upon the user to understand not only the data definitions and acquisition methods, but also the context in which the data were collected. This 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)	William Bechtold	828-257-4357	wabechtold@fs.fed.us
	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	651-649-5191	charleshperry@fs.fed.us
	Michael Amacher	435-755-3560	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 and others 2007))
- Ozone bioindicator sampling and estimation (Smith and others 2007)

- 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 and others 2005)
- Sampling protocols, estimation procedures, and analytical guidelines for down woody materials indicator of the Forest Inventory and Analysis Program, 2nd edition (Woodall and Monleon 2008)
- Sampling and estimation procedures for the vegetation diversity and structure indicator (Schulz and others, in press)

Plot Location

The FIADB includes coordinates for every plot location in the database, whether it is forested or not, but these are not the precise location of the plot centers. In an amendment to the Food Security Act of 1985 (reference 7 USC 2276 § 1770), Congress directed FIA to ensure the privacy of private landowners. Exact plot coordinates could be used in conjunction with other publicly available data to link plot data to specific landowners, in violation of 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 for making approximate coordinates available for all plots have been developed. These methods are collectively known as "fuzzing and swapping" (Lister and others 2005).

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

For plot data collected under the new annual system, plot numbers are reassigned to sever the link to other coordinates stored in the FIADB prior to the change in the law. Private plots are also swapped using the method described above – remeasured 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 miles on a small subset of

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

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

Chapter 2 -- Database Structure

Keys Presented with the Tables

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

Primary key
A single column in a table whose values uniquely identify each row in an Oracle[1] table.

The primary key in each FIADB 3.0 table is the CN column.

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

Table Name	Table Abbreviation
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	VSB
VEG_QUADRAT	VQT
VEG_SUBPLOT_SPP	VSS
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

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

Unique key

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

The unique key varies for each FIADB 3.0 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 3.0 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 one and only one record in another table. Foreign keys are used both to link records between data tables and as a check (or constraint) to prevent "unrepresented data". For example, if there are rows of data in the LICHEN_VISIT table for a specific plot, there needs to be a corresponding data row for that same plot in the PLOT table (phase 2). 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 3.0 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. 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. Introductory comments are presented at the beginning of each table to provide general guidelines for data use. Annual summary statistics may be summarized 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 levels. 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 phase 2 (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_3). Each regional analyst 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 and user guide 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 forestland 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 Spatial Data Services 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 data bases or map surfaces such as climate or seasonal drought. The goal is to ensure national consistency with respect to the published map products and interpretive reports on the ozone indicator.

Two general technical reports published by the USDA Forest Service, Forest Inventory and Analysis Program provide detailed information on historical changes to the ozone grid sample, and specific guidance on analyzing and interpreting ozone indicator variables and associated data bases. 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 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	KINDCD	Sample kind code	NUMBER(2)
15	LAT	Latitude	NUMBER(8,6)
16	LON	Longitude	NUMBER(9,6)
17	ELEVATION	Elevation	NUMBER
18	MANUAL	Field guide (manual) version number	NUMBER(3,1)
19	QA_STATUS	Quality assurance status	NUMBER(1)
20	CREW_TYPE	Crew type	NUMBER(1)
21	MANUAL_DB	Field guide (manual) version of the database	NUMBER(3,1)
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)
28	CYCLE	Inventory cycle number	NUMBER(2)
29	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	N/A	NOP_UK
Foreign	(SRV_CN)	OZONE_PLOT to SURVEY	NOP_SRV_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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/) .

4. INVYR   Inventory year. The year the ozone data were collected. All the plots on the ozone grid are measured every year.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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 for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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 that the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.

12. MEASMON   Measurement month. The month that the plot was completed.

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

13. MEASDAY   Measurement day. The day of the month that the plot was completed.

14. KINDCD   Sample kind code. This attribute is blank (null) and will be dropped in Version 4.0 because this information is located in OZONE_VISIT.SMPKNDCD.

15. 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.

16. 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.

17. 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.

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

19. QA_STATUS   QA Status. A code indicating the type of plot data collected. Production plots have QA_STATUS = 1 or 7.

Code	Description
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)

20. CREW_TYPE   Crew type. A code indicating what type of crew is measuring the plot.

Code	Description
1	Standard field crew
2	QA crew (any QA crew member present collecting remeasurement data)

21. MANUAL_DB

Manual (field guide) version of the database. A number that references a particular version of the National Field Guide (manual). The database coding standards have been updated to match this version of the National Field Guide. See MANUAL for information about the field guide version and associated data collection protocols that were used to collect the data.

22. CREATED_BY

The user who created the record.

23. CREATED_DATE

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

24. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

25. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

26. MODIFIED_DATE

> The date 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.

27. 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.

28. CYCLE   Inventory cycle number. For example, a 4 shows the data came from the fourth inventory of that State. A cycle number greater than 1 does not necessarily mean that information for previous cycles resides in the database.

29. 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 an indicator of 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 quality assurance status (QASTATCD) and crew type (CRWTYPCD) attributes indicate the type of data collected and whether or not it is intended for quality assurance purposes. 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 recorded 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 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)

	Column Name	Descriptive Name	Oracle data type
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	SMPKNDCD	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	QASTATCD	Quality assurance status code	NUMBER(1)
20	CRWTYPCD	Crew type code	NUMBER(1)
21	PLOTWET	Plot wetness	NUMBER
22	INJCHECK	Injury check	NUMBER(2)
23	GRIDDEN	Ozone grid density	NUMBER(1)
24	CREATED_BY	Created by	VARCHAR2(30)
25	CREATED_DATE	Created date	DATE
26	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
27	MODIFIED_BY	Modified by	VARCHAR2(30)
28	MODIFIED_DATE	Modified date	DATE
29	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

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 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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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   Description

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 that the plot was completed.

11. MEASMON   Measurement month. The month that the plot was completed.

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

12. MEASYEAR   Measurement year. The year that 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:

Code   Description
1   Greater than three acres
2   Greater than one acre, but less than three acres

For data prior to 2002, the PLTSIZE codes are:

Code   Description
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.
Code   Description
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.

Code   Description
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.

Code   Description
1   Soil is well drained
2   Soil is generally 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   Description
 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. QASTATCD   Quality assurance status code. A code indicating the type of data collected at the biosite and whether or not it is intended for quality assurance purposes. Each year, 10 biosites in each region are remeasured for quality assurance purposes. Generally, the remeasurements are blind.

 Code   Description
 1   Standard field plot, the data are not intended for quality assurance purposes
 6   QA field plot, the data are intended for quality assurance purposes

20. 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   Description
 1   Regular field crew
 2   QA field crew

21. 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 Description
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)

22. 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 is
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 Description

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.

23. 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.

Code Description

1   Unique ozone biosite within a polygon. (1 biosite:1polygon)
2   One of two or more ozone biosites within the same polygon.

24. CREATED_BY
The user who created the record.

25. CREATED_DATE

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

26. CREATED_IN_INSTANCE

The database instance in which the record was created. This
uniquely identifies which computer system was used to create the
record.

27. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

28. MODIFIED_DATE

> The date 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.

29. 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.

Ozone Validation Table (Oracle table name is OZONE_VALIDATION)

The attributes in this table are part of the validation file that is 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 only be used 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.

	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	Biospecies 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

	Column Name	Descriptive Name	Oracle data type
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	OVN_PK
Unique	(PLT_CN, BIOSPCD)	N/A	OVN_UK

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 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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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   Biospecies 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.

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

     Code   Description
     1   Standard field plot, the data are not intended for quality assurance purposes
     6   QA field plot, the data are 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.

     Code   Description
     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.

Code   Description
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.

Code   Description
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 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.

Code   Description
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 the plot was completed. For the ozone indicator, MEASYEAR is always the same as INVYR.

16. CREATED_BY

The user who created the record.

17. CREATED_DATE

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

18. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

19. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

20. MODIFIED_DATE

The date 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.

21. 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.

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 the number (or percent) of the total plots and plants that 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 the 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%; class three = 26-50%; class four = 51-75%; 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 provides 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	N/A	OBS_UK

1. CN   Sequence number. A unique sequence number used to identify an ozone biosite summary record

2. INVYR   Inventory year. The year the 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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes(The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/)

5. O3PLOT   Ozone plot. A unique identifier used in combination with STATECD, COUNTYCD, and INVYR to identify an ozone biosite. The last digit of O3PLOT will equal 1 when the biosite consists of one location or 2 when the biosite consists of two locations.

6. FIELD_ID   Field identification number. A system-generated number used to identify a biosite. There is only one record with a particular FIELD_ID value because data from multiple locations have been summarized to represent one biosite.

7. LOCATION_CNT

           Location count. A number indicating how many locations were sampled for a particular biosite. This attribute equals either 1 or 2. A value of 1 means that the plant count and injury data were collected from a single location and a value of 2 means data were collected from two locations. When two locations are used, the

data from both locations are combined in the biosite summary values.

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 is coded GROUND_LOC_CD = 1. Whenever an ozone biosite location moves to more than 3 miles from the initial location, the GROUND_LOC_CD is incremented by 1.

9. MEASYEAR   Measurement year. The year 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 ten 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 in the West is 2, while in the East it is 3 to 5. 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. SPECIES_EVAL_CNT = 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 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, and/or a relative measure of ozone air quality with respect to forest health. BIOSITE_INDEX = summation (BIOSPCD_INDEX) / SPECIES_EVAL_CNT

Biosite Index	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 = count (all plants with injury severity equal to zero) * 100/count (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 = count (all plants with injury severity equal to 1) * 100/count (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 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 = count (all plants with injury severity equal to 2) * 100/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 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 = count (all plants with injury severity equal to 3) * 100/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 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 = count (all plants with injury severity equal to 4) * 100/count (all plants evaluated at an ozone plot, i.e., PLANT_EVAL_CNT). A severity rating of 4 is assigned when on average, 51-75 percent of the leaf area of the injured leaves have ozone 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 = count (all plants with injury severity equal to 5) * 100/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 symptoms.

22. CREATED_BY

The user who created the record.

23. CREATED_DATE

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

24. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

25. MODIFIED_BY

>The user who modified the record. This field will be null if the data have not been modified since initial creation.

26. MODIFIED_DATE

>The date 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.

27. 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.

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 there are a small number of ozone biosites that 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, QASTATCD, 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)

	Column Name	Descriptive Name	Oracle data type
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	SOILDPTH	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	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 the 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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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 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 in the West is 2, while in the East it is 3 to 5. 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 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, and/or a relative measure of ozone air quality with respect to forest health. BIOSITE_INDEX = summation (BIOSPCD_INDEX) / SPECIES_EVAL_CNT

Biosite Index	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. Elevation data are obtained either by using a global positioning system (GPS) unit or a 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:

Code   Description
1   Greater than three acres
2   Greater than one acre, but less than three acres

For data prior to 2002, the PLTSIZE codes are:

Code	Description
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 flatland. In the west, the terrain may be more varied.

Code	Description
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.

Code	Description
1	Bedrock is not exposed
2	Bedrock is exposed; Soil is 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.

Code   Description
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.

Code   Description
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.

Code   Description
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.
BIOSITE_INDEX_MULTIPLIER = 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

The user who created the record.

23. CREATED_DATE

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

24. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

25 MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

26. MODIFIED_DATE

The date 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.

27. 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.

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 there are a small number of ozone biosites that 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)

	Column Name	Descriptive Name	Oracle data type
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	Biospecies sum	NUMBER
21	BIOSPCD_INDEX	Biospecies 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 the 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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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 incremented by 1.

9. MEASYEAR   Measurement year. The year 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.

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. AMT_MAX = 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. AMT_MIN = 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. AMT_MEAN = 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

Biospecies 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. BIOSPCD_SUM = summation ((plant's injury amount) * (plant's injury severity)) / PLANT_INJ_CNT

21. BIOSPCD_INDEX

Biospecies 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. BIOSPCD_INDEX = PLANT_RATIO * 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, crews use a global positioning system (GPS) unit 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:

Code   Description
1   Greater than three acres
2   Greater than one acre, but less than three acres

For data prior to 2002, the PLOTSIZE codes are:

Code   Description
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 flatland. In the West, the terrain may be more varied.

Code	Description
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.

Code	Description
1	Bedrock is not exposed
2	Bedrock is 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.

Code	Description
1	Soil is well drained
2	Soil is generally wet
3	Soil is 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.

   Code   Description
   1   This plot is wet; riparian zone or bottomland
   2   This plot is moderately dry; meadow or northeast-facing slope
   3   This 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.

   Code   Description
   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

   The user who created the record.

31. CREATED_DATE

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

32. CREATED_IN_INSTANCE

   The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

33. MODIFIED_BY

> The user who modified the record. This field will be null if the data
> have not been modified since initial creation.

34. MODIFIED_DATE

> The date 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.

35. 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 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	FLDCMTS1	Field comments 1	VARCHAR2(40)
12	FLDCMTS2	Field comments 2	VARCHAR2(40)
13	LIPROJCD	Lichen project code	NUMBER(2)
14	SMPLSTRT	Sample start time	NUMBER(4)
15	SMPLSTP	Sample stop time	NUMBER(4)
16	SMPLTIME	Sample time	NUMBER(4)
17	SFTWDPCT	Softwood percent (percent conifers)	NUMBER(3)
18	HRDWDPCT	Hardwood percent	NUMBER(3)
19	SHRUBPCT	Shrub percent	NUMBER(3)
20	GAPPCT	Gap percent	NUMBER(3)
21	GAPRCNT	Gap recent	NUMBER(2)
22	TALLSHRB	Tall shrubs	NUMBER(2)
23	FTRCD1	Feature code 1	NUMBER
24	FTRCD2	Feature code 2	NUMBER
25	FTRCD3	Feature code 3	NUMBER
26	FTRCD4	Feature code 4	NUMBER
27	ISSUECD1	Issue code 1	NUMBER
28	ISSUECD2	Issue code 2	NUMBER
29	ISSUECD3	Issue code 3	NUMBER
30	ISSUECD4	Issue code 4	NUMBER
31	SZCLSCD1	Size class code 1	NUMBER(2)
32	SZCLSCD2	Size class code 2	NUMBER(2)
33	SZCLSCD3	Size class code 3	NUMBER(2)
34	CREATED_BY	Created by	VARCHAR2(30)
35	CREATED_DATE	Created date	DATE

	Column Name	Descriptive Name	Oracle data type
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	LVT_PK
Unique	(PLT_CN)	N/A	LVT_UK
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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. MEASDAY Measurement day. This is the day on which the lichen plot was surveyed to provide the data presented.

8. MEASMON Measurement month. This is the month in which the lichen plot was surveyed to provide the data presented.

9. MEASYEAR Measurement year. This is 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.

Code	Description
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. FLDCMTS1 Field comments 1. This field is for any comments by the crew on the lichen plot or the sampling procedure not already indicated by FTRCDx, plot feature codes, or ISSUECDx, sampling issue codes.

12. FLDCMTS2 Field comments 2. This field is for any comments by the crew on the lichen plot or the sampling procedure not already indicated by FTRCDx, plot feature codes, or ISSUECDx, sampling issue codes.

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

                  Code   Description
                  1   Standard production plot
                  2   Special Study
                  3   Gradient Study
                  4   Evaluation Monitoring

14. 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).

15. 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).

16. 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).

17. 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.

18. HRDWDPCT   Hardwood percent. Percent canopy cover of the lichen plot in overstory hardwoods (not of lichens) estimated (not measured) in 5-percent classes.

19. SHRUBPCT   Shrub percent. Percent of the lichen plot with shrubs estimated (not measured) in 5-percent classes.

20. 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 3-5% 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.

21. 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).

                  Code   Description
                  0   ≥ 5 yr old
                  1   < 5 yr old

22. TALLSHRB   Tall shrubs. A code indicating whether or not the gap had > 40%
                    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.

                    Code   Description
                    0   No tall shrubs
                    1   Tall shrubs present

23. 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.

                    Code   Description
                    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

24. 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.

25. 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.

26. 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.

27. 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	Description
0	No significant issues
1	Too wet to see lichens well
2	Too dark to see lichen 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

28. 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.

29. 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.

30. 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.

31. 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 (DBH, inches)
        1   < 10
        2   10-20
        3   21-30
        4   31-40
        5   > 40

32. 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.

33. 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.

34. CREATED_BY

    The user who created the record.

35. CREATED_DATE

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

36. CREATED_IN_INSTANCE

    The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

37. MODIFIED_BY

    The user who modified the record. This field will be null if the data have not been modified since initial creation.

38. MODIFIED_DATE

    The date 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.

39. 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
Foreign	(PLT_CN)	LICHEN_LAB to PLOT	LCH_PLT_FK

1. CN   Sequence number. A unique sequence number used to identify a lichens 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. LICH_SPPCD

                  Lichen species code. A unique lichen species numerical code for a single taxon, linked with unique SPP_ACRONYM and a unique combination of GENUS and SPECIES in table REF_LICHEN_SPECIES.

8. MEASYEAR   Measurement year. This is 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.

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 implemented

12. CREATED_BY

The user who created the record.

13. CREATED_DATE

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

14. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

15. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

16. MODIFIED_DATE

The date 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.

17. 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 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
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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. MEASYEAR   Measurement year. This is 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. This is a measure of how evenly abundance is distributed among species, calculated as (DIVERSITY = H')/ ln (RICHNESS).

11. DIVERSITY   Diversity. Diversity is the Shannon-Wiener Diversity Index:

$H' = -\sum(Pi*ln(Pi))$ for all species 1 to i on a plot

where Pi is the proportion of total abundance for species i on that plot. Pi = (ABUNDANCE for species i on that plot) / SUMMATION.

12. CREATED_BY

The user who created the record.

13. CREATED_DATE

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

14. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

15. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

16. MODIFIED_DATE

The date 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.

17. 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 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(40)
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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

3. LICHEN_REGION

Lichen region. A code indicating the lichen region (see table below). This is 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. 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.

5. MEASYEAR   Measurement year. This is 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, for example Northeastern, Mid-Atlantic, Southeastern, etc.

7. SPP_ACRONYM

    Species acronym. 3 to 6-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 * (# plots with species present)/PLOTS_IN_REGION. Note that plots searched and found to have no lichens are counted for the denominator.

11. SPECIES   Species. The lichen species name (including subspecies, variety, or form if needed). 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.

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

    The user who created the record.

71

14. CREATED_DATE

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

15. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

16. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

17. MODIFIED_DATE

> The date 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.

18. 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 Reference Lichen Species 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(40)
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 (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, SPP_ACRONYM, GENUS, and SPECIES as needed.

3. YEAREND   Year end. The year a particular combination of LICH_SPPCD, SPP_ACRONYM, GENUS, and 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, 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 3 to 6-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

                   The user who created the record.

9. CREATED_DATE

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

10. CREATED_IN_INSTANCE

>   The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

11. MODIFIED_BY

>   The user who modified the record. This field will be null if the data have not been modified since initial creation.

12. MODIFIED_DATE

>   The date 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.

13. 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 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 of 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
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:

Abundances for individual taxa	Abundance for final combined taxon
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

The user who created the record.

8. CREATED_DATE

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

9. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

10. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

11. MODIFIED_DATE

The date 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.

12.   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 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
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 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. MEASDAY   Measurement day. The day of the month that the plot was completed.

8. MEASMON   Measurement month. The month that the plot was completed.

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

9. MEASYEAR   Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.

10. CREATED_BY

> The user who created the record.

11. CREATED_DATE

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

12. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

13. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

14. MODIFIED_DATE

> The date 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

> 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

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

2. PLT_CN   Plot sequence number. A unique sequence number used to relate the soils erosion 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

6. PLOT   Phase 2 plot number. An identifier for a plot location. 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. Periodic inventories' subplot numbers will vary. For more information, contact the appropriate FIA unit.

8. MEASYEAR   Measurement year. The year 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)] should be 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 purposes of 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	Description	Code	Description
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	Description	Code	Description
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	Description
1	Present
0	Not present

12. TYPCMPCD   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).

Code	Description
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.

Code	Description
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.

Code	Description
1	Present
0	Not present

15. CREATED_BY

The user who created the record.

16. CREATED_DATE

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

17. CREATED_IN_INSTANCE

The database instance in which the record was created. This
uniquely identifies which computer system was used to create the
record.

18. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

19. MODIFIED_DATE

> The date 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.

20. 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 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	TXTRLYR1	Texture layer 1	NUMBER
22	TXTRLYR2	Texture layer 2	NUMBER
23	DPTHSBSL	Depth to a restricted layer	NUMBER
24	SOILS_STATCD	Soil sampling status	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

1. CN   Sequence number. A unique sequence number used to identify a soils sample location record.

2. PLT_CN   Plot sequence number. A unique sequence number used to relate the soils sample location 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes(The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

6. PLOT   Phase 2 plot number. An identifier for a plot location. 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 should equal the subplot number (SUBP). Values are 2, 3, 4.

8. MEASYEAR   Measurement year. The year 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 0.1inch) 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 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 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 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/)
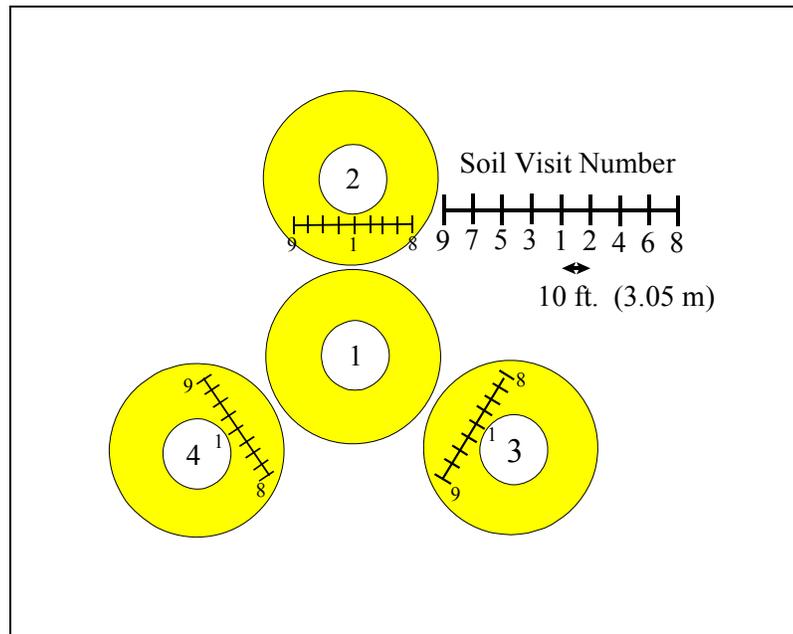
21. TXTRLYR1   Texture layer 1. A code indicating the soil texture of the 0-4 inch layer estimated in the field.

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

22. TXTRLYR2   Texture layer 2. A code indicating the soil texture of the 4-8 inch layer estimated in the field.

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

23. DPTHSBSL   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   Description
1   Sampled
2   Not sampled: non-forest

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

25. CREATED_BY

The user who created the record.

26. CREATED_DATE

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

27. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record

28. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

29. MODIFIED_DATE

The date 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.

30. 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 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 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	Oven-dry 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 in water	NUMBER(7,3)
28	PH_CACL2	pH in calcium chloride	NUMBER(7,3)
29	EXCHNG_NA	Exchangeable sodium	NUMBER(7,3)
30	EXCHNG_K	Exchangeable potassium	NUMBER(7,3)
31	EXCHNG_MG	Exchangeable magnesium	NUMBER(7,3)
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)

	Column Name	Descriptive Name	Oracle data type
35	EXCHNG_MN	Exchangeable manganese	NUMBER(7,3)
36	EXCHNG_FE	Exchangeable iron	NUMBER(7,3)
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(7,3)
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

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

2. PLT_CN   Plot sequence number. A unique sequence number used to relate the soils 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes(The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

6. PLOT   Phase 2 plot number. An identifier for a plot location. 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 should equal 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/)
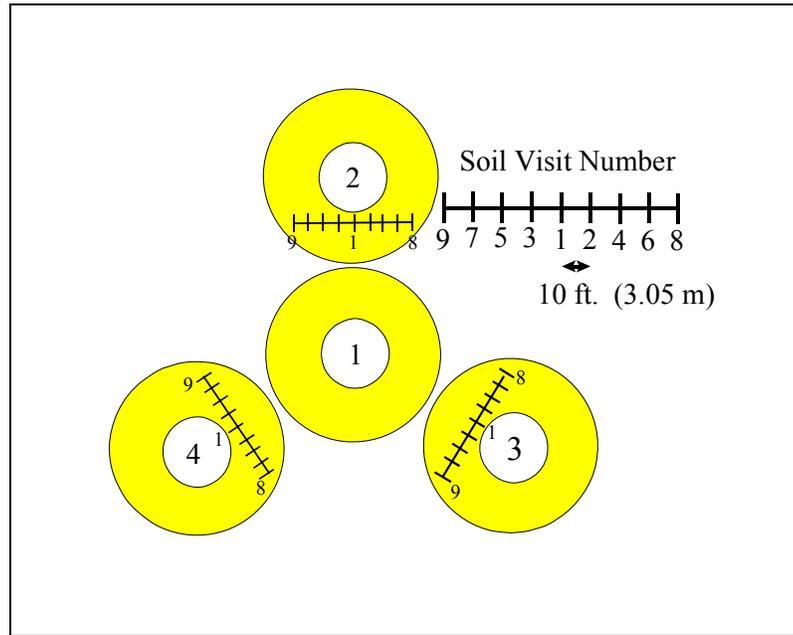
9. LAYER_TYPE

Layer Type. Indicates the soil layer type.

Code	Description
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	Description
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 ≥ 1.0).

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

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 g.

16. AIR_DRY_SOIL_WT

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

17. OVEN_DRY_SOIL_WT

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

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^3 .

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_H20   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 $CaCl_2$ 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$_c$/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 the plot was completed. MEASYEAR may differ from INVYR.

46. MODIFIED_BY

    The user who modified the record. This field will be null if the data have not been modified since initial creation.

47. MODIFIED_DATE

    The date 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.

48. 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.

49. CREATED_BY

    The user who created the record.

50. CREATED_DATE

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

51. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

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_CREW_TYPE	Vegetation crew type	NUMBER(1)
15	VEG_SAMPLE_BASIS	Vegetation sample basis	NUMBER(1)
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	VVT_PK
Unique	(PLT_CN)	N/A	VVT_UK
Natural	INVYR, STATECD, 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.

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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

6. PLOT   Phase 2 plot number. An identifier for a plot location. 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.

Code	Description
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.

Code	Description
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% was added starting with VEG_MANUAL = 2.0.1.

Code	Description
0	Trace cover value (0.01%, 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%, 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_CREW_TYPE

Vegetation crew type. A code indicating the type of crew measuring the P3 Vegetation Diversity and Structure.

Code	Description
1	Regular field crew
2	QA crew (any QA crew member present collecting data)

15. 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% 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) 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.

Code   Description
1   Data collected across entire subplot where % accessible
       forest conditions is greater than or equal to 50%
       (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)

16. CREATED_BY

The user who created the record.

17. CREATED_DATE

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

18. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

19. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

20. MODIFIED_DATE

The date 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.

21. 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.

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	VARCHAR2(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
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
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	(INVYR, STATECD, COUNTYCD, PLOT, VEG_FLDSPCD, UNIQUE_SP_NBR)	N/A	VPS_NAT_I
Foreign	(PLT_CN, VVT_CN)	VEG_PLOT_SPECIES to VEG_VISIT	VPS_VVT_FK

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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

7. PLOT   Phase 2 plot number. An identifier for a plot location. 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 2000 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 2000.

11. SPECIMEN_COLLECTED

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

> Code Description
> 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.

> | Code | Description |
> |------|-------------|
> | 01 | Species is locally sparse |
> | 02 | Species has < 1% 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.

> | Code | Description |
> |------|-------------|
> | N | 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. |
> | Y | Yes, specimen resolved. The unknown specimen has been identified and VEG_SPCD has been updated. |
> | Blank (null) | Specimen resolution not required. |

15. CREATED_BY

> The user who created the record.

16. CREATED_DATE

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

17. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

18. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

19. MODIFIED_DATE

> The date 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.

20. 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.

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	COMMUNITY_DESC_SPECIMEN_LABEL	Community description specimen label	VARCHAR2(200)
14	TOTAL_CANOPY_COVER_LAYER_1	Total canopy cover layer 1	NUMBER(3)
15	TOTAL_CANOPY_COVER_LAYER_2	Total canopy cover layer 2	NUMBER(3)
16	TOTAL_CANOPY_COVER_LAYER_3	Total canopy cover layer 3	NUMBER(3)
17	TOTAL_CANOPY_COVER_LAYER_4	Total canopy cover layer 4	NUMBER(3)
18	CRYPTO_CRUST_COVER_PCT	Cryptobiotic crust cover percent	NUMBER(3)
19	LICHEN_COVER_PCT	Lichen cover percent	NUMBER(3)
20	LITTER_DUFF_COVER_PCT	Litter and duff percent cover	NUMBER(3)
21	MINERAL_SOIL_COVER_PCT	Mineral soil cover percent	NUMBER(3)
22	MOSS_COVER_PCT	Moss cover percent	NUMBER(3)
23	ROAD_TRAIL_COVER_PCT	Road and trail cover percent	NUMBER(3)
24	ROCK_COVER_PCT	Rock cover percent	NUMBER(3)
25	STANDING_WATER_COVER_PCT	Standing water cover percent	NUMBER(3)
26	STREAM_LAKE_COVER_PCT	Stream and lake cover percent	NUMBER(3)
27	TRASH_JUNK_COVER_PCT	Trash and junk cover percent	NUMBER(3)
28	WOOD_COVER_PCT	Wood cover percent	NUMBER(3)
29	VEG_SUBP_STATUS_CD_PRE2004	Vegetation subplot status code, pre2004	NUMBER(1)
30	VEG_SUBP_NONSMP_RSN_CD_PRE2004	Vegetation subplot nonsampled reason code, pre2004	NUMBER(2)
31	CREATED_BY	Created by	VARCHAR2(30)
32	CREATED_DATE	Created date	DATE
33	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)

	Column Name	Descriptive Name	Oracle data type
34	MODIFIED_BY	Modified by	VARCHAR2(30)
35	MODIFIED_DATE	Modified date	DATE
36	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	(INVYR, STATECD, COUNTYCD, PLOT, SUBP)	N/A	VSB_NAT_I
Foreign	(PLT_CN, VVT_CN)	VEG_SUBPLOT to VEG_VISIT	VSB_VVT_FK

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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing

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

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

7. PLOT   Phase 2 plot number. An identifier for a plot location. 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   Description
            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   Description
            1   Sampled – at least one accessible forest land condition present
            2   Sampled – no accessible forest land condition present on subplot
            3   Nonsampled

117

10. VEG_SUBP_NONSAMPLE_REASN_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	Description
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.

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. COMMUNITY_DESC_SPECIMEN_LABEL

Community description specimen label. To fully automate
Specimen Label, a brief description of the community type to aid
the taxonomist in the identification of any specimens collected
from this subplot is recorded. Community descriptions often
describe the dominant overstory species (i.e., Open mixed conifer,
closed paper birch, pinyon juniper woodland).

14. 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 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%, the
assessment is made over the entire subplot, including all
conditions.

15. 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 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%, the
assessment is made over the entire subplot, including all
conditions.

16. 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%, the
assessment is made over the entire subplot, including all
conditions.

17. 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%, the assessment is made over the entire subplot, including all conditions.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. 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.

25. 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.

26. 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.

27. 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.

28. 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.

29. 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% forested in order to be sampled. If at least 50% 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	Description
1	Sampled – subplot accessible forest condition is greater than or equal to 50% of subplot
2	Sampled – subplot accessible forest condition is less than 50% of subplot
3	Nonsampled

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

31. CREATED_BY

> The user who created the record.

32. CREATED_DATE

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

33. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

34. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

35. MODIFIED_DATE

> The date 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.

36. 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.

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	(INVYR, STATECD, 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

8. PLOT   Phase 2 plot number. An identifier for a plot location. 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.

   Code   Description
   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.

   Code   Description
   1   Quadrat on 30° subplot transect
   2   Quadrat on 150° subplot transect
   3   Quadrat on 270° subplot transect

11. CONDID   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 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. 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 was not sampled. This value is derived for VEG_VISIT.VEG_MANUAL = 1.7 plots.

Code	Description
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% accessible forest. This variable is not available for VEG_VISIT.VEG_MANUAL = 2.0 and higher.

Code	Description
1	Quadrat sampled (at least 50% 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% 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	Description
1	Low: 0-10% of quadrat trampled: pristine to relatively undisturbed.
2	Moderate: 10-50% of quadrat trampled: trampling by animals or field crew
3	Heavy: >50% of quadrat trampled: hiking trail or heavily grazed.

15. CREATED_BY

   The user who created the record.

16. CREATED_DATE

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

17. CREATED_IN_INSTANCE

   The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

18. MODIFIED_BY

   The user who modified the record. This field will be null if the data have not been modified since initial creation.

19. MODIFIED_DATE

   The date 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.

20. 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.

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, SUBP)	N/A	VSS_UK
Natural	(INVYR, STATECD, COUNTYCD, PLOT, SUBP, VEG_FLDSPCD, UNIQUE_SP_NBR)	N/A	VSS_NAT_I
Foreign	(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 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing

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

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

9. PLOT   Phase 2 plot number. An identifier for a plot location. 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   Description
    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 2000 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 2000.

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.

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.

Code	Description
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.

Code	Description
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.

Code	Description
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.

Code	Description
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.

Code	Description
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

The user who created the record.

24. CREATED_DATE

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

25. CREATED_IN_INSTANCE

    The database instance in which the record was created. This
    uniquely identifies which computer system was used to create the
    record.

26. MODIFIED_BY

    The user who modified the record. This field will be null if the data
    have not been modified since initial creation.

27. MODIFIED_DATE

    The date 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.

28. 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.

Down Woody Material Visit Table (Oracle table name is DWM_VISIT)

	Column Name	Descriptive Name	Oracle data type
1	CN	Sequence number	VARCHAR2(34)
2	PLT_CN	Plot sequence number	VARCHAR2(34)
3	INVYR	Inventory year	NUMBER(4)
4	STATECD	State code	NUMBER(4)
5	COUNTYCD	County code	NUMBER(3)
6	PLOT	Phase 2 plot number	NUMBER(5)
7	MEASDAY	Measurement day	NUMBER(2)
8	MEASMON	Measurement month	NUMBER(2)
9	MEASYEAR	Measurement year	NUMBER(4)
10	QASTATCD	Quality assurance status code	NUMBER(1)
11	CRWTYPCD	Crew type code	NUMBER(1)
12	SMPKNDCD	Sample kind code	NUMBER(2)
13	CREATED_BY	Created by	VARCHAR2(30)
14	CREATED_DATE	Created date	DATE
15	CREATED_IN_INSTANCE	Created in instance	NUMBER(6)
16	MODIFIED_BY	Modified by	VARCHAR2(30)
17	MODIFIED_DATE	Modified date	DATE
18	MODIFIED_IN_INSTANCE	Modified in instance	NUMBER(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
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 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes(The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

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

8. MEASMON   Measurement month. The month in which the plot was completed.

Code   Description
01   January
02   February
03   March
04   April
05   May
06   June
07   July

08 August
09 September
10 October
11 November
12 December

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

10. QASTATCD   Quality assurance status code. A code indicating the type of plot data collected. Production plots have QASTATCD = 1 or 7.

Code   Description

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

11. CRWTYPCD   Crew type code. A code identifying the type of crew measuring the plot.

Code   Description
1   Standard field crew
2   QA crew (any QA crew member present collecting data)

12. SMPKNDCD   Sample kind code. A code indicating the type of plot installation.

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

13. CREATED_BY

The user who created the record.

14. CREATED_DATE

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

15. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

16. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

17. MODIFIED_DATE

The date 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.

18. 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.

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 number	NUMBER
10	MEASYEAR	Measurement year	NUMBER(4)
11	SLOPDIST	Slope distance	NUMBER
12	SPCD	Species code	NUMBER(3)
13	DECAYCD	Decay code	NUMBER(1)
14	TRANSDIA	Transect diameter	NUMBER(3)
15	SMALLDIA	Small diameter	NUMBER(3)
16	LARGEDIA	Large diameter	NUMBER(3)
17	LENGTH	Length	NUMBER(3)
18	HOLLOWCD	Hollow code	VARCHAR2(1)
19	CWDHSTCD	Coarse woody debris history code	NUMBER(1)
20	CREATED_BY	Created by	VARCHAR2(30)
21	CREATED_DATE	Created date	DATE
22	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
23	MODIFIED_BY	Modified by	VARCHAR2(30)
24	MODIFIED_DATE	Modified date	DATE
25	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

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

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. A unique sequence number used to relate the down woody material coarse woody debris 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes(The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. SUBP   Subplot number. A code indicating the number of the subplot
                  center from which the transect originates.

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

8. TRANSECT   Transect. A code indicating the azimuth of the subplot transect on
                  which the piece is sampled.

                  Code   Description
                  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 number.

10. MEASYEAR   Measurement year. The year the plot was completed. MEASYEAR
                  may differ from INVYR.

11. SLOPDIST   Slope distance. Coarse woody debris (CWD) slope distance
                  indicating the slope distance from the subplot center to the point
                  where the transect intersects the longitudinal center of the piece.
                  Recorded to the nearest 0.1 feet.

12. SPCD   Species code. An FIA tree species code. Refer to Appendix F in
                  the user guide for Phase 2 (The Forest Inventory and Analysis
                  Database: Database Description and Users Manual Version 3.0 for
                  Phase 2, available at: http://www.fia.fs.fed.us/library/database-
                  documentation/) for codes.

13. DECAYCD   Decay code. Coarse woody debris (CWD) decay class, which
                  predominates along the recorded CWD total length of the piece.

Decay Class	Structural Integrity	Texture of Rotten Portions	Color of Wood	Invading Roots	Branches and Twigs
1	Sound, freshly fallen, intact logs	Intact, no rot; conks of stem decay absent	Original color	Absent	If branches are present, fine twigs are still attached and have tight bark
2	Sound	Mostly intact; sapwood partly soft (starting to decay) but can't be pulled apart by hand	Original color	Absent	If branches are present, many fine twigs are gone and remaining fine twigs have peeling bark
3	Heartwood sound; piece supports its own weight	Hard, large pieces; sapwood can be pulled apart by hand or sapwood absent	Reddish-brown or original color	Sapwood only	Branch stubs will not pull out
4	Heartwood rotten; piece does not support its own weight, but maintains its shape	Soft, small blocky pieces; a metal pin can be pushed into heartwood	Reddish or light brown	Throughout	Branch stubs pull out
5	None, piece no longer maintains its shape, it spreads out on ground	Soft; powdery when dry	Red-brown to dark brown	Throughout	Branch stubs and pitch pockets have usually rotted down

Note: CWD decay class 5 pieces must still resemble a log, therefore, the first tally rule is that they must be ≥ 5.0 inches in diameter, ≥ 5.0 inches from the surface of the ground, and at least 3.0 feet long

14. TRANSDIA   Transect diameter. The diameter at point of intersection that indicates the piece's diameter at the point where the transect intersects the longitudinal center of the piece. Recorded to the nearest inch.

15. SMALLDIA   Small diameter. The diameter at the small end that indicates the diameter at the piece's small end, recorded to the nearest inch. The diameter at the small end occurs either at (1) the actual end of the piece, if the end has a diameter ≥ 3.0 inches, or (2) at the point where the piece tapers down to 3.0 inches in diameter.

16. LARGEDIA   Large diameter. The diameter at the large end that indicates the diameter at the piece's large end, recorded to the nearest inch. The large end will occur either at a broken or sawn end, at a fracture, or at the root collar.

17. LENGTH   Length. CWD total length is the length of the piece that lies between the piece's recorded diameter at the small end and diameter at the large end. Recorded to the nearest foot.

18. HOLLOWCD   Hollow code. A code indicating whether or not the piece is hollow.

Code	Description
Y	A piece is considered hollow if a cavity extends at least 2 feet along the central longitudinal axis of the piece, and the diameter of the entrance to the cavity is at least 1/4 of the diameter of the piece where the entrance occurs. The entrance occurs at the point where the circumference of the cavity is whole -- the point where wood is present completely around the circumference of the cavity. The length of the cavity begins at this point.
N	Does not meet criteria for being a hollow log

19. CWDHSTCD   Coarse woody debris history code. A code indicating whether or not the piece of CWD is on the ground as a result of harvesting operations or as a result of natural circumstances.

Code	Description
1	CWD piece is on the ground as a result of natural causes
2	CWD piece is on the ground as a result of major recent harvest activity (<= 15 yrs old)
3	CWD piece is on the ground as a result of older harvest activity (> 15 yrs old)
4	CWD piece is on the ground as a result of an incidental harvest (such as firewood cutting)
5	Exact Reason Unknown

20. CREATED_BY

The user who created the record.

21. CREATED_DATE

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

22. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

23. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

24. MODIFIED_DATE

> The date 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.

25. 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.

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	DUFFDEP	Duff depth	NUMBER
13	LITTDEP	Litter depth	NUMBER
14	FUELDEP	Fuelbed depth	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	DDL_PK
Unique	(PLT_CN, TRANSECT, SUBP, SMPLOCCD)	N/A	DDL_UL

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. A unique sequence number used to relate the down woody material duff, litter, fuel 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. TRANSECT   Transect. A code indicating the azimuth of the subplot transect.

Code   Description
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 of the subplot center from which the transect originates.

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

9. SMPLOCCD   Sample location code. A code indicating the duff/litter sample location. Note: During 2001 field season duff/litter sampled at two locations (14 and 24 feet), while from 2002 to present duff/litter are sampled at one location along the CWD transect at 24 feet.

Code	Description
1	Duff/litter sampled at 14 feet slope distance
2	Duff/litter sampled at 24 feet slope distance

10. MEASYEAR   Measurement year. The year 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.

Code	Description
0	Duff and litter depth not sampled; Fuelbed is sampled
1	All sampled: Duff, litter, and fuelbed
2	Nothing sampled; Duff, litter, fuelbed are not sampled

12. DUFFDEP   Duff depth. Depth of duff layer to the nearest 0.1 inch.

13. LITTDEP   Litter depth. Depth of litter layer to the nearest 0.1 inch.

14. FUELDEP   Fuelbed depth. Depth of fuelbed to the nearest 0.1 foot.

15. CREATED_BY

The user who created the record.

16. CREATED_DATE

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

17. CREATED_IN_INSTANCE

> The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

18. MODIFIED_BY

> The user who modified the record. This field will be null if the data have not been modified since initial creation.

19. MODIFIED_DATE

> The date 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.

20. 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.

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 of forest	NUMBER(1)
10	MEASYEAR	Measurement year	NUMBER(4)
11	SMALLCT	Small count	NUMBER(3)
12	MEDIUMCT	Medium count	NUMBER(3)
13	LARGECT	Large count	NUMBER(3)
14	RSNCTCD	Reason count code	NUMBER(1)
15	PILESCD	Piles code	NUMBER(1)
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	DFW_PK
Unique	(PLT_CN, TRANSECT, SUBP, CONDID)	N/A	DFW_UK

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. A unique sequence number used to relate the down woody material fine woody debris 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes(The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

6. PLOT   Phase 2 plot number. An identifier for a plot location. Along with STATECD, INVYR, and COUNTYCD, 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   Description
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. Number of the subplot. Annual inventories have subplot number values of 1 through 4. Periodic inventories subplot

numbers will vary. For more information, contact the appropriate FIA unit.

9.   CONDID   Forest condition class. 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.

10. MEASYEAR   Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.

11. SMALLCT   Small count. 1-hr FWD tally. The number of pieces counted in this size class (0.01 to 0.24-inch diameter) along the transect segment. Individual pieces are tallied up to 50, then ocularly estimated over a tally of 50.

12. MEDIUMCT   Medium count. 10-hr FWD tally. The number of pieces counted in this size class (0.25 to 0.9-inch diameter) along the transect segment. Individual pieces are tallied up to 50, then ocularly estimated over a tally of 50.

13. LARGECT   Large count. 100-hr FWD tally. The number of pieces counted in this size class (1.0 to 2.9 inch diameter) along the transect segment. 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 applies to the situation encountered on the transect if any of the counts (SMALLCT, MEDIUMCT, or LARGRECT) on that transect are greater than 100 pieces. A code > 0 is entered if any of the counts on a transect are greater than 100 pieces.

Code	Description
0	FWD is not unusually high
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

152

15. PILESCD   Piles code. A code indicating whether a residue pile intersects the FWD transect segment.

Code   Description
0   No
1   Yes

16. CREATED_BY

The user who created the record.

17. CREATED_DATE

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

18. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

19. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

20. MODIFIED_DATE

The date 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.

21. 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.

**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	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

1. CN   Sequence number. A unique sequence number used to identify a
               down woody material microplot fuel record.

2. PLT_CN   Plot sequence number. A unique sequence number used to relate
               the down woody material microplot fuel 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. SUBP   Subplot number. A code indicating the number of the subplot center from which the transect originates.

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

8. MEASYEAR   Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.

9. LVSHRBCD   Live shrub code. A code indicating the cover class that indicates the percent cover of the forested microplot area covered with live shrubs.

Code   Description
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 code indicating the cover class that indicates the percent cover of the forested microplot area covered with dead shrubs and dead branches attached to live shrubs if visible from above.

Code   Description
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 code indicating the cover class that indicates the percent cover of the forested microplot area covered with live herbaceous plants.

Code   Description
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 code indicating the cover class that indicates the percent cover of the forested microplot area covered with dead herbaceous plants and dead leaves attached to live plants if visible from above.

Code   Description
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 code indicating the cover class that indicates 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   Description
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 ≥ 6 feet are estimated.

15. DSHRBHT   Dead shrub height. Indicates the height of the tallest dead shrub to the nearest 0.1 foot. Heights < 6 feet are measured and heights ≥ 6 feet are estimated.

16. LVHRBHT   Live herb height. Indicates the height (at the tallest point) of the live herbaceous layer to the nearest 0.1 foot. Maximum height is 6 feet.

17. DHRBHT   Dead herb height. Indicates the height (at the tallest point) of the dead herbaceous layer to the nearest 0.1 foot. Maximum height is 6 feet.

18. CREATED_BY

    The user who created the record.

19. CREATED_DATE

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

20. CREATED_IN_INSTANCE

    The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

21. MODIFIED_BY

    The user who modified the record. This field will be null if the data have not been modified since initial creation.

22. MODIFIED_DATE

    The date 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.

23. 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.

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	Subplot pile number	NUMBER
9	MEASYEAR	Measurement year	NUMBER(4)
10	CONDID	Condition class of the forest	NUMBER(1)
11	SHAPECD	Shape code	NUMBER(1)
12	AZIMUTH	Azimuth	NUMBER(3)
13	DENSITY	Density (packing ratio of pile)	NUMBER(2)
14	HEIGHT1	Pile height 1	NUMBER(2)
15	WIDTH1	Pile width 1	NUMBER(2)
16	LENGTH1	Pile length 1	NUMBER(2)
17	HEIGHT2	Pile height 2	NUMBER(2)
18	WIDTH2	Pile width 2	NUMBER(2)
19	LENGTH2	Pile length 2	NUMBER(2)
20	CREATED_BY	Created by	VARCHAR2(30)
21	CREATED_DATE	Created date	DATE
22	CREATED_IN_INSTANCE	Created in instance	VARCHAR2(6)
23	MODIFIED_BY	Modified by	VARCHAR2(30)
24	MODIFIED_DATE	Modified date	DATE
25	MODIFIED_IN_INSTANCE	Modified in instance	VARCHAR2(6)

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

1. CN   Sequence number. A unique sequence number used to identify a down woody material residual pile record.

2. PLT_CN   Plot sequence number. A unique sequence number used to relate the down woody material residual pile 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. SUBP   Subplot number. A code indicating the number of the subplot center from which the transect originates.

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

8. PILE   Subplot pile number. The number identifying the residual pile.

9. MEASYEAR   Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.

10. CONDID   Forest condition class. 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.

11. SHAPECD   Shape code. A code indicating shape code of the pile depending on its unique shape. See also the figure below.
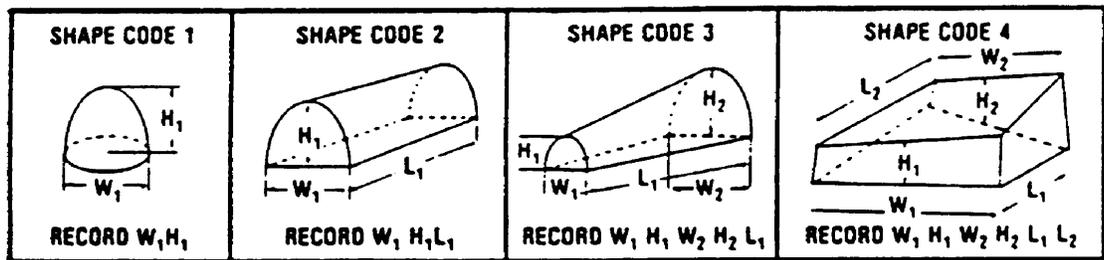
PILE SHAPE codes (Hardy 1996). Figure 14-12 from the Forest Inventory and Analysis National Core Field Guide (Phase 3, version 3.0) (see http://www.fia.fs.fed.us/library/field-guides-methods-proc/

            Code   Description
            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.

Code	Description
00	Absent
01	Trace (< 1% cover)
10	1 – 10%
20	11-20%
30	21-30%
….	
90	81-90%
99	91-100%

14. HEIGHT1   Pile height1. The estimated height (in feet) of either end of the pile. Pile height 1 may equal pile height 2. See figure under SHAPECD

15. WIDTH1   Pile width1 (ft). The estimated width (in feet) of the side of HEIGHT1. Pile width 1 may equal pile width 2. See figure under SHAPECD.

16. LENGTH1   Pile length1. The estimated length (in feet) of either side of the pile. Pile length 1 may equal pile length 2. See figure under SHAPECD.

17. HEIGHT2   Pile height2. The estimated height (in feet) of either end of the pile. Pile height 1 may equal pile height 2. See figure under SHAPECD.

18. WIDTH2   Pile width2. The estimated width (in feet) of the side of Height2. Pile width 1 may equal pile width 2. See figure under SHAPECD.

19. LENGTH2   Pile length2. The length (in feet) of either side of the pile. Pile length 1 may equal pile length 2. See figure in SHAPECD.

20. CREATED_BY

The user who created the record.

21. CREATED_DATE

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

22. CREATED_IN_INSTANCE

The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

23. MODIFIED_BY

The user who modified the record. This field will be null if the data have not been modified since initial creation.

24. MODIFIED_DATE

The date 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.

25. 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

.

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	NUMBER(3)
9	SEGMNT	Transect segment number	NUMBER(1)
10	MEASYEAR	Measurement year	NUMBER(4)
11	CONDID	Condition class of the segment	NUMBER(1)
12	BEGNDIST	Beginning distance	NUMBER
13	ENDDIST	Ending distance	NUMBER
14	SLOPE	Slope of segment	NUMBER
15	HORIZDIST	Horizontal distance of segment	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	DTS_PK
Unique	(PLT_CN, SUBP, TRANSECT, SEGMNT)	N/A	DTS_UK

1. CN — Sequence number. A unique sequence number used to identify a down woody material transect segment record.

2. PLT_CN — Plot sequence number. A unique sequence number used to relate the down woody material transect segment 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 Phase 3 plots that are "off subpanel". This is due to differences in measurement intervals between Phase 3 (measurement interval=5 years) and Phase 2 (measurement interval=10 years) plots. Only users interested in performing certain Phase 3 data analyses should access plots with this anomalous value in INVYR.

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 phase 2 document (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, 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, 1990, are used. Refer to appendix C for codes (The Forest Inventory and Analysis Database: Database Description and Users Manual Version 3.0 for Phase 2, available at: http://www.fia.fs.fed.us/library/database-documentation/).

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

7. SUBP Subplot number. A code indicating the subplot center from which the transect originates.

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

8. TRANSECT Transect. A code indicating the azimuth of the subplot transect on which the piece is sampled.

Code Description
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 Transect segment number. Number of each segment, numbered sequentially from the beginning of each individual transect.

10. MEASYEAR Measurement year. The year the plot was completed. MEASYEAR may differ from INVYR.

11. CONDID Condition class of the segment. 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. The first segment recorded for each DWM transect will have the same condition class number as assigned to the subplot center.

12. BEGNDIST Beginning distance. The location (using slope distance) on the transect line where the transect intersects the boundary with the adjacent condition class nearer to the subplot center. The first record for each transect will have a beginning distance of 00.0 ft. Each subsequent record will have a beginning distance equal to the ending distance of the previous record. Measured to the nearest 0.1 ft.

13. ENDDIST Ending distance. The location (using slope distance) on the transect line where the transect exits the condition class being delineated and intersects the boundary with a different condition class further away from the subplot center. If no other condition classes are encountered, the location (using slope distance) of the end of the transect line is recorded. Measured to the nearest 0.1 foot.

14. SLOPE Segment slope. Indicates the average slope percent along the transect within the condition class being segmented. When only

one condition class is present on a transect, slope percent is the average slope percent along the entire transect. Measured to the nearest 5 percent.

15. HORIZDIST   Horizontal distance. Segment horizontal distance (in feet).

16. CREATED_BY

     The user who created the record.

17. CREATED_DATE

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

18. CREATED_IN_INSTANCE

     The database instance in which the record was created. This uniquely identifies which computer system was used to create the record.

19. MODIFIED_BY

     The user who modified the record. This field will be null if the data have not been modified since initial creation.

20. MODIFIED_DATE

     The date 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.

21. 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.

Chapter 3 -- Views

VEG_QUADRAT_SPP

The data presented in this created view originates from the Vegetation Subplot Species Table (VEG_SUBPLOT_SPP). In the Vegetation Subplot Species table, each subplot species record contains presence/absence information on each quadrat. The Quadrat Species "view" is the first step to put the data in a format where it can be easily used for estimations of species quadrat frequency and quadrat-level species richness.

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 view 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^2). 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 where rooted in or overhanging within 6 feet).

```
CREATE OR REPLACE VIEW VEG_QUADRAT_SPP_VW
(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","PL
OT","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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Acknowledgments

This document is based on previous documentation of the nationally standardized Forest Inventory and Analysis database (Hansen and others 1992, Woudenberg and Farrenkopf 1995, Miles and others 2001). The following persons contributed to this document as section authors, editors, and compilers:

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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 and field guide section	Table name	Location in table	Description
ABUNDANCE_CLASS (10.3.9)	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 (9.4.11)	OZONE_PLOT_SUMMARY	13	Aspect
ASPECT (9.4.11)	OZONE_SPECIES_SUMMARY	24	Aspect
ASPECT (9.4.11)	OZONE_VISIT	14	Aspect
AZIMUTH (14.8.3)	DWM_RESIDUAL_PILE	12	Bearing from subplot to pile (deg)
BEGNDIST (14.3.4)	DWM_TRANSECT_SEGMENT	12	Segment begin slope distance (ft)
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 (9.6.1)	OZONE_SPECIES_SUMMARY	10	Bioindicator species code
BIOSPCD (9.6.1)	OZONE_VALIDATION	9	Bioindicator species code
BIOSPCD_INDEX	OZONE_SPECIES_SUMMARY	21	Biospecies index
BIOSPCD_SUM	OZONE_SPECIES_SUMMARY	20	Biospecies 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
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

Column name and field guide section	Table name	Location in table	Description
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
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	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
COARSE_FRACTION_PCT	SOILS_LAB	22	Coarse fraction percent
COMMUNITY_DESC_SPECIMEN _LABEL (13.4.6)	VEG_SUBPLOT	13	Community description for specimen label
COMPCPCT (11.6.2)	SOILS_EROSION	10	Compacted area percent
CONDID (14.5.2)	DWM_FINE_WOODY_DEBRIS	9	Forest condition class number
CONDID (14.8.2)	DWM_RESIDUAL_PILE	10	Forest condition class of pile
CONDID (14.3.3)	DWM_TRANSECT_SEGMENT	11	Segment condition class number
CONDID (11.7.9)	SOILS_SAMPLE_LOC	19	Forest condition class number
CONDID (13.7.3)	VEG_QUADRAT	11	Condition class number
COUNTYCD	DWM_COARSE_WOODY_DEBRIS	5	County code

Column name and field guide section	Table name	Location in table	Description
COUNTYCD	DWM_DUFF_LITTER_FUEL	5	County code
COUNTYCD	DWM_FINE_WOODY_DEBRIS	5	County code
COUNTYCD	DWM_MICROPLOT_FUEL	5	County code
COUNTYCD	DWM_RESIDUAL_PILE	5	County code
COUNTYCD	DWM_TRANSECT_SEGMENT	5	County code
COUNTYCD	DWM_VISIT	5	County code
COUNTYCD (10.3.5)	LICHEN_LAB	5	County code
COUNTYCD (10.3.5)	LICHEN_PLOT_SUMMARY	5	County code
COUNTYCD (10.3.5)	LICHEN_VISIT	5	County code
COUNTYCD (9.4.2)	OZONE_BIOSITE_SUMMARY	4	County code
COUNTYCD (9.4.2)	OZONE_PLOT	7	County code
COUNTYCD (9.4.2)	OZONE_PLOT_SUMMARY	4	County code
COUNTYCD (9.4.2)	OZONE_SPECIES_SUMMARY	4	County code
COUNTYCD (9.4.2)	OZONE_VALIDATION	5	County code
COUNTYCD (9.4.2)	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 (13.3.2)	VEG_PLOT_SPECIES	6	County code
COUNTYCD (13.3.2)	VEG_QUADRAT	7	County code
COUNTYCD (13.3.2)	VEG_SUBPLOT	6	County code
COUNTYCD (13.3.2)	VEG_SUBPLOT_SPP	8	County code
COUNTYCD (13.3.2)	VEG_VISIT	5	County code
CREATED_BY	DWM_COARSE_WOODY_DEBRIS	20	Created by
CREATED_BY	DWM_DUFF_LITTER_FUEL	15	Created by
CREATED_BY	DWM_FINE_WOODY_DEBRIS	16	Created by
CREATED_BY	DWM_MICROPLOT_FUEL	18	Created by
CREATED_BY	DWM_RESIDUAL_PILE	20	Created by
CREATED_BY	DWM_TRANSECT_SEGMENT	16	Created by
CREATED_BY	DWM_VISIT	13	Created by
CREATED_BY	LICHEN_LAB	12	Created by
CREATED_BY	LICHEN_PLOT_SUMMARY	12	Created by

Column name and field guide section	Table name	Location in table	Description
CREATED_BY	LICHEN_SPECIES_SUMMARY	13	Created by
CREATED_BY	LICHEN_VISIT	34	Created by
CREATED_BY	OZONE_BIOSITE_SUMMARY	22	Created by
CREATED_BY	OZONE_PLOT	22	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	24	Created by
CREATED_BY	REF_LICHEN_SPECIES	8	Created by
CREATED_BY	REF_LICHEN_SPP_COMMENTS	7	Created by
CREATED_BY	SOILS_EROSION	15	Created by
CREATED_BY	SOILS_LAB	49	Created by
CREATED_BY	SOILS_SAMPLE_LOC	25	Created by
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	31	Created by
CREATED_BY	VEG_SUBPLOT_SPP	23	Created by
CREATED_BY	VEG_VISIT	16	Created by
CREATED_DATE	DWM_COARSE_WOODY_DEBRIS	21	Created date
CREATED_DATE	DWM_DUFF_LITTER_FUEL	16	Created date
CREATED_DATE	DWM_FINE_WOODY_DEBRIS	17	Created date
CREATED_DATE	DWM_MICROPLOT_FUEL	19	Created date
CREATED_DATE	DWM_RESIDUAL_PILE	21	Created date
CREATED_DATE	DWM_TRANSECT_SEGMENT	17	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	35	Created date
CREATED_DATE	OZONE_BIOSITE_SUMMARY	23	Created date
CREATED_DATE	OZONE_PLOT	23	Created date
CREATED_DATE	OZONE_PLOT_SUMMARY	23	Created date

Column name and field guide section	Table name	Location in table	Description
CREATED_DATE	OZONE_SPECIES_SUMMARY	31	Created date
CREATED_DATE	OZONE_VALIDATION	17	Created date
CREATED_DATE	OZONE_VISIT	25	Created date
CREATED_DATE	REF_LICHEN_SPECIES	9	Created date
CREATED_DATE	REF_LICHEN_SPP_COMMENTS	8	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	32	Created date
CREATED_DATE	VEG_SUBPLOT_SPP	24	Created date
CREATED_DATE	VEG_VISIT	17	Created date
CREATED_IN_INSTANCE	DWM_COARSE_WOODY_DEBRIS	22	Created in instance
CREATED_IN_INSTANCE	DWM_DUFF_LITTER_FUEL	17	Created in instance
CREATED_IN_INSTANCE	DWM_FINE_WOODY_DEBRIS	18	Created in instance
CREATED_IN_INSTANCE	DWM_MICROPLOT_FUEL	20	Created in instance
CREATED_IN_INSTANCE	DWM_RESIDUAL_PILE	22	Created in instance
CREATED_IN_INSTANCE	DWM_TRANSECT_SEGMENT	18	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	36	Created in instance
CREATED_IN_INSTANCE	OZONE_BIOSITE_SUMMARY	24	Created in instance
CREATED_IN_INSTANCE	OZONE_PLOT	24	Created in instance
CREATED_IN_INSTANCE	OZONE_PLOT_SUMMARY	24	Created in instance
CREATED_IN_INSTANCE	OZONE_SPECIES_SUMMARY	32	Created in instance
CREATED_IN_INSTANCE	OZONE_VALIDATION	18	Created in instance
CREATED_IN_INSTANCE	OZONE_VISIT	26	Created in instance
CREATED_IN_INSTANCE	REF_LICHEN_SPECIES	10	Created in instance
CREATED_IN_INSTANCE	REF_LICHEN_SPP_COMMENTS	9	Created in instance

Column name and field guide section	Table name	Location in table	Description
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	33	Created in instance
CREATED_IN_INSTANCE	VEG_SUBPLOT_SPP	25	Created in instance
CREATED_IN_INSTANCE	VEG_VISIT	18	Created in instance
CREW_TYPE (9.4.6)	OZONE_PLOT	20	Crew type code
CRWTYPCD	DWM_VISIT	11	Crew type code
CRWTYPCD (9.4.6)	OZONE_VALIDATION	11	Crew type code
CRWTYPCD (9.4.6)	OZONE_VISIT	20	Crew type code
CRYPTO_CRUST_COVER_PCT (13.6.1)	VEG_SUBPLOT	18	Ground cover (Cryptobiotic Crust)
CTY_CN	OZONE_PLOT	3	County sequence number
CWDHSTCD (14.4.3.9)	DWM_COARSE_WOODY_DEBRIS	19	History of coarse woody debris piece
CWDID	DWM_COARSE_WOODY_DEBRIS	9	Coarse woody debris identification
CYCLE	OZONE_PLOT	28	Inventory cycle number
DECAYCD (14.4.3.4)	DWM_COARSE_WOODY_DEBRIS	13	Decay class
DENSITY (14.8.11)	DWM_RESIDUAL_PILE	13	Packing ratio of pile (%)
DETAILED_NONFOREST_LAND_USE (13.4.5)	VEG_SUBPLOT	12	Detailed nonforest land use
DHRBCD (14.7.8)	DWM_MICROPLOT_FUEL	12	Dead herb cover (%)
DHRBHT (14.7.9)	DWM_MICROPLOT_FUEL	17	Dead herb height (ft)
DIVERSITY	LICHEN_PLOT_SUMMARY	11	Diversity
DPTHSBSL (11.7.20)	SOILS_SAMPLE_LOC	23	Depth to a restricted layer
DSHRBCD (14.7.4)	DWM_MICROPLOT_FUEL	10	Dead shrub cover (%)
DSHRBHT (14.7.5)	DWM_MICROPLOT_FUEL	15	Dead shrub height (ft)
DUFFDEP (14.6.6)	DWM_DUFF_LITTER_FUEL	12	Depth of duff layer
DUMMY_SUBP_COVER_PRE2004	VEG_SUBPLOT_SPP	21	Dummy subplot cover prior to 2004
ECEC	SOILS_LAB	34	Effective cation exchange capacity

Column name and field guide section	Table name	Location in table	Description
ELEV	OZONE_PLOT_SUMMARY	11	Elevation
ELEV	OZONE_SPECIES_SUMMARY	22	Elevation
ELEVATION (9.4.17)	OZONE_PLOT	17	Elevation
ENDDIST (14.3.6)	DWM_TRANSECT_SEGMENT	13	Segment end slope distance (ft)
EVENNESS	LICHEN_PLOT_SUMMARY	10	Evenness
EXCHNG_AL	SOILS_LAB	33	Exchangeable aluminum
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
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
FLDCMTS1	LICHEN_VISIT	11	Field comments (1-2)
FLDCMTS2	LICHEN_VISIT	12	Field comments (1-2)
FORFLTHK	SOILS_SAMPLE_LOC	9	Forest floor thickness
FORFLTHKE (11.7.13)	SOILS_SAMPLE_LOC	15	Forest floor thickness at the east edge of the sampling frame
FORFLTHKN (11.7.12)	SOILS_SAMPLE_LOC	11	Forest floor thickness at the north edge of the

Column name and field guide section	Table name	Location in table	Description
			sampling frame
FORFLTHKS (11.7.14)	SOILS_SAMPLE_LOC	13	Forest floor thickness at the south edge of the sampling frame
FORFLTHKW (11.7.15)	SOILS_SAMPLE_LOC	17	Forest floor thickness at the west edge of the sampling frame
FREQUENCY_PCT	LICHEN_SPECIES_SUMMARY	10	Frequency percent
FTRCD1 (10.3.23)	LICHEN_VISIT	23	Features code 1
FTRCD2 (10.3.23)	LICHEN_VISIT	24	Features code 2
FTRCD3 (10.3.23)	LICHEN_VISIT	25	Features code 3
FTRCD4 (10.3.23)	LICHEN_VISIT	26	Features code 4
FUELDEP (14.6.8)	DWM_DUFF_LITTER_FUEL	14	Depth of fuelbed (ft)
GAPPCT (10.3.21.1)	LICHEN_VISIT	20	Gap percent
GAPRCNT (10.3.21.2)	LICHEN_VISIT	21	Gap percent
GENUS	LICHEN_SPECIES_SUMMARY	8	Genus
GENUS	REF_LICHEN_SPECIES	5	Genus
GRIDDEN	OZONE_VISIT	23	Grid density
GROUND_LOC_CD	OZONE_BIOSITE_SUMMARY	8	Ground location code
GROUND_LOC_CD	OZONE_SPECIES_SUMMARY	8	Ground location code
HEIGHT1 (14.8.9)	DWM_RESIDUAL_PILE	14	Pile height1 (ft)
HEIGHT2 (14.8.10)	DWM_RESIDUAL_PILE	17	Pile height2 (ft)
HOLLOWCD (14.4.3.8)	DWM_COARSE_WOODY_DEBRIS	18	Hollow code
HORIZDIST	DWM_TRANSECT_SEGMENT	15	Horizontal distance of segment (ft)
HRDWDPCT (10.3.17)	LICHEN_VISIT	18	Percent hardwood
INJCHECK (9.4.16)	OZONE_VISIT	22	Injury check
INJVALID	OZONE_VALIDATION	13	Injury validation
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

Column name and field guide section	Table name	Location in table	Description
INVYR	LICHEN_PLOT_SUMMARY	3	Inventory year
INVYR	LICHEN_SPECIES_SUMMARY	2	Inventory year
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 (10.3.24)	LICHEN_VISIT	27	Issues code 1
ISSUECD2 (10.3.24)	LICHEN_VISIT	28	Issues code 2
ISSUECD3 (10.3.24)	LICHEN_VISIT	29	Issues code 3
ISSUECD4 (10.3.24)	LICHEN_VISIT	30	Issues code 4
KINDCD	OZONE_PLOT	14	Sample kind code
LAB_ID	SOILS_LAB	13	Laboratory identification
LARGECT (14.5.5)	DWM_FINE_WOODY_DEBRIS	13	100-hr fine woody debris tally
LARGEDIA (14.4.3.6.3)	DWM_COARSE_WOODY_DEBRIS	16	Large diameter
LAT	OZONE_PLOT	15	Fuzzed coordinates
LAT	OZONE_PLOT_SUMMARY	20	Fuzzed coordinates
LAYER_TYPE	SOILS_LAB	9	Layer type
LEAFVCHR	OZONE_VALIDATION	12	Leaf voucher
LENGTH (14.4.3.7)	DWM_COARSE_WOODY_DEBRIS	17	Length of log
LENGTH1 (14.8.5)	DWM_RESIDUAL_PILE	16	Pile length1 (ft)
LENGTH2 (14.8.6)	DWM_RESIDUAL_PILE	19	Pile length2 (ft)

Column name and field guide section	Table name	Location in table	Description
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 (13.6.2)	VEG_SUBPLOT	19	Lichen ground cover percent
LICHEN_REGION	LICHEN_SPECIES_SUMMARY	3	Lichen region
LICHEN_REGION_DESCR	LICHEN_SPECIES_SUMMARY	6	Lichen region description
LICHEN_STATCD (10.3.13)	LICHEN_VISIT	10	Lichens collected
LIPROJCD (10.3.7)	LICHEN_VISIT	13	Lichen project code
LITTDEP (14.6.7)	DWM_DUFF_LITTER_FUEL	13	Depth of litter layer (in)
LITTER_DUFF_COVER_PCT (13.6.3)	VEG_SUBPLOT	20	Litter/duff ground cover percent
LITTERCD (14.7.10)	DWM_MICROPLOT_FUEL	13	Litter code
LOCATION_CNT	OZONE_BIOSITE_SUMMARY	7	Location count
LON	OZONE_PLOT	16	Fuzzed coordinates
LON	OZONE_PLOT_SUMMARY	21	Fuzzed coordinates
LTRLRTHK	SOILS_SAMPLE_LOC	10	Litter layer thickness
LTRLRTHKE (11.7.17)	SOILS_SAMPLE_LOC	16	Litter layer thickness at the east edge of the sampling frame
LTRLRTHKN (11.7.16)	SOILS_SAMPLE_LOC	12	Litter layer thickness at the north edge of the sampling frame
LTRLRTHKS (11.7.18)	SOILS_SAMPLE_LOC	14	Litter layer thickness at the south edge of the sampling frame
LTRLRTHKW (11.7.19)	SOILS_SAMPLE_LOC	18	Litter layer thickness at the west edge of the sampling frame
LVHRBCD (14.7.6)	DWM_MICROPLOT_FUEL	11	Live herb cover (%)
LVHRBHT (14.7.7)	DWM_MICROPLOT_FUEL	16	Live herb height (ft)
LVSHRBCD (14.7.2)	DWM_MICROPLOT_FUEL	9	Live shrub cover (%)
LVSHRBHT (14.7.3)	DWM_MICROPLOT_FUEL	14	Live shrub height (ft)
MANUAL	OZONE_PLOT	18	Field guide (manual) version number
MANUAL_DB	OZONE_PLOT	21	Field guide (manual) version of the database
MAX_COVER_LAYER_NBR_PRE 2004	VEG_SUBPLOT_SPP	22	Maximum cover layer number prior to 2004

Column name and field guide section	Table name	Location in table	Description
MEASDAY	DWM_VISIT	7	Measurement day
MEASDAY	LICHEN_VISIT	7	Measurement day
MEASDAY (9.4.8.3)	OZONE_PLOT	13	Measurement day
MEASDAY (9.4.8.3)	OZONE_VISIT	10	Measurement day
MEASDAY	SOILS_VISIT	7	Measurement day
MEASMON	DWM_VISIT	8	Measurement month
MEASMON	LICHEN_VISIT	8	Measurement month
MEASMON (9.4.8.2)	OZONE_PLOT	12	Measurement month
MEASMON (9.4.8.2)	OZONE_VISIT	11	Measurement month
MEASMON	SOILS_VISIT	8	Measurement month
MEASYEAR	DWM_COARSE_WOODY_DEBRIS	10	Measurement year
MEASYEAR	DWM_DUFF_LITTER_FUEL	10	Measurement year
MEASYEAR	DWM_FINE_WOODY_DEBRIS	10	Measurement year
MEASYEAR	DWM_MICROPLOT_FUEL	8	Measurement year
MEASYEAR	DWM_RESIDUAL_PILE	9	Measurement year
MEASYEAR	DWM_TRANSECT_SEGMENT	10	Measurement year
MEASYEAR	DWM_VISIT	9	Measurement year
MEASYEAR	LICHEN_LAB	8	Measurement year
MEASYEAR	LICHEN_PLOT_SUMMARY	7	Measurement year
MEASYEAR	LICHEN_SPECIES_SUMMARY	5	Measurement year
MEASYEAR	LICHEN_VISIT	9	Measurement year
MEASYEAR (9.4.8.1)	OZONE_BIOSITE_SUMMARY	9	Measurement year
MEASYEAR (9.4.8.1)	OZONE_PLOT	11	Measurement year
MEASYEAR (9.4.8.1)	OZONE_PLOT_SUMMARY	8	Measurement year
MEASYEAR (9.4.8.1)	OZONE_SPECIES_SUMMARY	9	Measurement year
MEASYEAR (9.4.8.1)	OZONE_VALIDATION	15	Measurement year
MEASYEAR (9.4.8.1)	OZONE_VISIT	12	Measurement year
MEASYEAR	SOILS_EROSION	8	Measurement year
MEASYEAR	SOILS_LAB	45	Measurement year
MEASYEAR	SOILS_SAMPLE_LOC	8	Measurement year
MEASYEAR	SOILS_VISIT	9	Measurement year
MEDIUMCT	DWM_FINE_WOODY_DEBRIS	12	10-hr fine woody debris tally
MINERAL_SOIL_COVER_PCT	VEG_SUBPLOT	21	Mineral soil ground cover percent

Column name and field guide section	Table name	Location in table	Description
(13.6.4)			
MODIFIED_BY	DWM_COARSE_WOODY_DEBRIS	23	Modified by
MODIFIED_BY	DWM_DUFF_LITTER_FUEL	18	Modified by
MODIFIED_BY	DWM_FINE_WOODY_DEBRIS	19	Modified by
MODIFIED_BY	DWM_MICROPLOT_FUEL	21	Modified by
MODIFIED_BY	DWM_RESIDUAL_PILE	23	Modified by
MODIFIED_BY	DWM_TRANSECT_SEGMENT	19	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	37	Modified by
MODIFIED_BY	OZONE_BIOSITE_SUMMARY	25	Modified by
MODIFIED_BY	OZONE_PLOT	25	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	27	Modified by
MODIFIED_BY	REF_LICHEN_SPECIES	11	Modified by
MODIFIED_BY	REF_LICHEN_SPP_COMMENTS	10	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	34	Modified by
MODIFIED_BY	VEG_SUBPLOT_SPP	26	Modified by
MODIFIED_BY	VEG_VISIT	19	Modified by
MODIFIED_DATE	DWM_COARSE_WOODY_DEBRIS	24	Modified date
MODIFIED_DATE	DWM_DUFF_LITTER_FUEL	19	Modified date
MODIFIED_DATE	DWM_FINE_WOODY_DEBRIS	20	Modified date
MODIFIED_DATE	DWM_MICROPLOT_FUEL	22	Modified date

Column name and field guide section	Table name	Location in table	Description
MODIFIED_DATE	DWM_RESIDUAL_PILE	24	Modified date
MODIFIED_DATE	DWM_TRANSECT_SEGMENT	20	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	38	Modified date
MODIFIED_DATE	OZONE_BIOSITE_SUMMARY	26	Modified date
MODIFIED_DATE	OZONE_PLOT	26	Modified date
MODIFIED_DATE	OZONE_PLOT_SUMMARY	26	Modified date
MODIFIED_DATE	OZONE_SPECIES_SUMMARY	34	Modified date
MODIFIED_DATE	OZONE_VALIDATION	20	Modified date
MODIFIED_DATE	OZONE_VISIT	28	Modified date
MODIFIED_DATE	REF_LICHEN_SPECIES	12	Modified date
MODIFIED_DATE	REF_LICHEN_SPP_COMMENTS	11	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	35	Modified date
MODIFIED_DATE	VEG_SUBPLOT_SPP	27	Modified date
MODIFIED_DATE	VEG_VISIT	20	Modified date
MODIFIED_IN_INSTANCE	DWM_COARSE_WOODY_DEBRIS	25	Modified in instance
MODIFIED_IN_INSTANCE	DWM_DUFF_LITTER_FUEL	20	Modified in instance
MODIFIED_IN_INSTANCE	DWM_FINE_WOODY_DEBRIS	21	Modified in instance
MODIFIED_IN_INSTANCE	DWM_MICROPLOT_FUEL	23	Modified in instance
MODIFIED_IN_INSTANCE	DWM_RESIDUAL_PILE	25	Modified in instance
MODIFIED_IN_INSTANCE	DWM_TRANSECT_SEGMENT	21	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

Column name and field guide section	Table name	Location in table	Description
MODIFIED_IN_INSTANCE	LICHEN_SPECIES_SUMMARY	18	Modified in instance
MODIFIED_IN_INSTANCE	LICHEN_VISIT	39	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_BIOSITE_SUMMARY	27	Modified in instance
MODIFIED_IN_INSTANCE	OZONE_PLOT	27	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	29	Modified in instance
MODIFIED_IN_INSTANCE	REF_LICHEN_SPECIES	13	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	36	Modified in instance
MODIFIED_IN_INSTANCE	VEG_SUBPLOT_SPP	28	Modified in instance
MODIFIED_IN_INSTANCE	VEG_VISIT	21	Modified in instance
MOSS_COVER_PCT (13.6.5)	VEG_SUBPLOT	22	Moss ground cover percent
N_TOTAL_PCT	SOILS_LAB	26	Nitrogen total percent
O3_STATCD (9.4.1)	OZONE_VALIDATION	14	Ozone status code
O3PLOT (9.4.4)	OZONE_BIOSITE_SUMMARY	5	Ozone plot
O3PLOT (9.4.4)	OZONE_PLOT	8	Ozone plot
O3PLOT (9.4.4)	OZONE_PLOT_SUMMARY	5	Ozone plot
O3PLOT (9.4.4)	OZONE_SPECIES_SUMMARY	5	Ozone plot
O3PLOT (9.4.4)	OZONE_VALIDATION	6	Ozone plot
O3PLOT (9.4.4)	OZONE_VISIT	6	Ozone plot
OLSEN_P	SOILS_LAB	44	Olsen phosphorus
ORIGIN_FLAG	LICHEN_LAB	10	Origin flag
OVEN_DRY_SOIL_WT	SOILS_LAB	17	Oven-dry soil weight
PH_CACL2	SOILS_LAB	28	pH measured in calcium chloride
PH_H2O	SOILS_LAB	27	pH measured in water

Column name and field guide section	Table name	Location in table	Description
PILE	DWM_RESIDUAL_PILE	8	Subplot pile number
PILESCD	DWM_FINE_WOODY_DEBRIS	15	Pile code
PLANT_EVAL_CNT	OZONE_BIOSITE_SUMMARY	11	Plant evaluation count
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
PILE (14.8.1)	DWM_RESIDUAL_PILE	8	Subplot pile number
PLOT	DWM_COARSE_WOODY_DEBRIS	6	P2 plot number
PLOT	DWM_DUFF_LITTER_FUEL	6	P2 plot number
PLOT	DWM_FINE_WOODY_DEBRIS	6	P2 plot number
PLOT	DWM_MICROPLOT_FUEL	6	P2 plot number
PLOT	DWM_RESIDUAL_PILE	6	P2 plot number
PLOT	DWM_TRANSECT_SEGMENT	6	P2 plot number
PLOT	DWM_VISIT	6	P2 plot number
PLOT (10.3.3)	LICHEN_LAB	6	P2 plot number
PLOT (10.3.3)	LICHEN_PLOT_SUMMARY	6	P2 plot number
PLOT (10.3.3)	LICHEN_VISIT	6	P2 plot number
PLOT	SOILS_EROSION	6	P2 plot number
PLOT	SOILS_LAB	6	P2 plot number
PLOT	SOILS_SAMPLE_LOC	6	P2 plot number
PLOT	SOILS_VISIT	6	P2 plot number
PLOT (13.3.3)	VEG_PLOT_SPECIES	7	P2 plot number
PLOT (13.3.3)	VEG_QUADRAT	8	P2 plot number
PLOT (13.3.3)	VEG_SUBPLOT	7	P2 plot number
PLOT (13.3.3)	VEG_SUBPLOT_SPP	9	P2 plot number
PLOT (13.3.3)	VEG_VISIT	6	P2 plot number
PLOTS_IN_REGION	LICHEN_SPECIES_SUMMARY	12	Plots in region (number)
PLOTWET (9.4.14)	OZONE_PLOT_SUMMARY	17	Plot wetness
PLOTWET (9.4.14)	OZONE_SPECIES_SUMMARY	28	Plot wetness
PLOTWET (9.4.14)	OZONE_VISIT	21	Plot wetness
PLT_CN	DWM_COARSE_WOODY_DEBRIS	2	Plot sequence number

Column name and field guide section	Table name	Location in table	Description
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
PLTDSTRB (9.4.15)	OZONE_PLOT_SUMMARY	18	Plot disturbance
PLTDSTRB (9.4.15)	OZONE_SPECIES_SUMMARY	29	Plot disturbance
PLTDSTRB (9.4.15)	OZONE_VISIT	18	Plot disturbance
PLTSIZE (9.4.10)	OZONE_PLOT_SUMMARY	12	Plot size
PLTSIZE (9.4.10)	OZONE_SPECIES_SUMMARY	23	Plot size
PLTSIZE (9.4.10)	OZONE_VISIT	13	Plot size
QA_STATUS (9.4.5)	OZONE_PLOT	19	Quality assurance status
QASTATCD	DWM_VISIT	10	Quality assurance status code
QASTATCD	OZONE_VALIDATION	10	Quality assurance status code
QASTATCD	OZONE_VISIT	19	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

Column name and field guide section	Table name	Location in table	Description
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 (13.7.2)	VEG_QUADRAT	10	Quadrat number
QUADRAT_STATUS (13.7.4)	VEG_QUADRAT	12	Quadrat status code
QUADRAT_STATUS_PRE2004	VEG_QUADRAT	13	Maximum cover layer number prior to 2004
RESIDUAL_WATER_CONTENT_ PCT	SOILS_LAB	19	Residual water content percent
RICHNESS	LICHEN_PLOT_SUMMARY	9	Richness
ROAD_TRAIL_COVER_PCT (13.6.6)	VEG_SUBPLOT	23	Road/trail ground cover percent
ROCK_COVER_PCT (13.6.7)	VEG_SUBPLOT	24	Rock ground cover percent
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 identifier
SAMPLER_TYPE	SOILS_LAB	10	Sampler type
SEGMNT	DWM_TRANSECT_SEGMENT	9	Segment number
SFTWDPCT (10.3.16)	LICHEN_VISIT	17	Percent conifer
SHAPECD	DWM_RESIDUAL_PILE	11	Pile shape code
SHRUBPCT (10.3.18)	LICHEN_VISIT	19	Percent shrub
SLOPDIST (14.4.3.3)	DWM_COARSE_WOODY_DEBRIS	11	Slope distance
SLOPE (14.3.5)	DWM_TRANSECT_SEGMENT	14	Segment slope (%)
SMALLCT (14.5.3)	DWM_FINE_WOODY_DEBRIS	11	1-hr fine woody debris tally
SMALLDIA (14.4.3.6.2)	DWM_COARSE_WOODY_DEBRIS	15	Small diameter
SMPKNDCD	DWM_VISIT	12	Sample kind code
SMPKNDCD (9.4.7)	OZONE_VISIT	9	Ozone sample kind code
SMPLDCD (14.6.5)	DWM_DUFF_LITTER_FUEL	11	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 (10.3.15)	LICHEN_VISIT	15	Sample stop time
SMPLSTRT (10.3.14)	LICHEN_VISIT	14	Sample start time

Column name and field guide section	Table name	Location in table	Description
SMPLTIME	LICHEN_VISIT	16	Total sample time
SOILDPTH (9.4.13)	OZONE_PLOT_SUMMARY	15	Soil depth
SOILDPTH (9.4.13)	OZONE_SPECIES_SUMMARY	26	Soil depth
SOILDPTH (9.4.13)	OZONE_VISIT	16	Soil depth
SOILDRN (9.4.14)	OZONE_PLOT_SUMMARY	16	Soil drainage
SOILDRN (9.4.14)	OZONE_SPECIES_SUMMARY	27	Soil drainage
SOILDRN (9.4.14)	OZONE_VISIT	17	Soil drainage
SOILS_STATCD (11.7.11)	SOILS_SAMPLE_LOC	24	Soil sampling status code
SOILSPCT (11.6.1)	SOILS_EROSION	9	Bare soil percent
SP_CANOPY_COVER_LAYER_1_2	VEG_SUBPLOT_SPP	14	Species canopy cover layer 1 and 2 percent
SP_CANOPY_COVER_LAYER_3	VEG_SUBPLOT_SPP	15	Species canopy cover layer 3
SP_CANOPY_COVER_LAYER_4	VEG_SUBPLOT_SPP	16	Species canopy cover layer 4
SP_CANOPY_COVER_TOTAL	VEG_SUBPLOT_SPP	17	Total species canopy cover percent
SPCD (14.4.3.5)	DWM_COARSE_WOODY_DEBRIS	12	Species Code
SPECIES	LICHEN_SPECIES_SUMMARY	11	Species
SPECIES	REF_LICHEN_SPECIES	6	Species
SPECIES_EVAL_CNT	OZONE_BIOSITE_SUMMARY	13	Species evaluation count
SPECIES_EVAL_CNT	OZONE_PLOT_SUMMARY	9	Species evaluation count
SPECIMEN_COLLECTED (13.8.1.3)	VEG_PLOT_SPECIES	11	Specimen collected
SPECIMEN_LABEL_NBR (13.8.1.4)	VEG_PLOT_SPECIES	12	Specimen label number for unknown specimen collected
SPECIMEN_NOT_COLLECTED_REASON (13.8.1.5)	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
SPLIT_PLOTID	OZONE_VISIT	8	Split plot identification
SPP_ACRONYM	LICHEN_SPECIES_SUMMARY	7	Species acronym
SPP_ACRONYM	REF_LICHEN_SPECIES	4	Species acronym

Column name and field guide section	Table name	Location in table	Description
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
STANDING_WATER_COVER_PCT (13.6.8)	VEG_SUBPLOT	25	Standing water/flooded ground cover percent
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 (10.3.4)	LICHEN_LAB	4	State code
STATECD (10.3.4)	LICHEN_PLOT_SUMMARY	4	State code
STATECD (10.3.4)	LICHEN_VISIT	4	State code
STATECD (9.4.1)	OZONE_BIOSITE_SUMMARY	3	State code
STATECD (9.4.1)	OZONE_PLOT	5	State code
STATECD (9.4.1)	OZONE_PLOT_SUMMARY	3	State code
STATECD (9.4.1)	OZONE_SPECIES_SUMMARY	3	State code
STATECD (9.4.1)	OZONE_VALIDATION	4	State code
STATECD (9.4.1)	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 (13.3.1)	VEG_PLOT_SPECIES	5	State code
STATECD (13.3.1)	VEG_QUADRAT	6	State code
STATECD (13.3.1)	VEG_SUBPLOT	5	State code
STATECD (13.3.1)	VEG_SUBPLOT_SPP	7	State code
STATECD (13.3.1)	VEG_VISIT	4	State ode
STREAM_LAKE_COVER_PCT (13.6.9)	VEG_SUBPLOT	26	Stream/lake ground cover percent

Column name and field guide section	Table name	Location in table	Description
SUBCYCLE	OZONE_PLOT	29	Subcycle number
SUBP (14.4.3.1)	DWM_COARSE_WOODY_DEBRIS	7	Subplot number
SUBP (14.6.3)	DWM_DUFF_LITTER_FUEL	8	Subplot number
SUBP (14.5.1)	DWM_FINE_WOODY_DEBRIS	8	Subplot number
SUBP (14.7.1)	DWM_MICROPLOT_FUEL	7	Subplot number
SUBP (14.8.1)	DWM_RESIDUAL_PILE	7	Subplot number
SUBP (14.3.1)	DWM_TRANSECT_SEGMENT	7	Subplot number
SUBP (13.7.1)	VEG_QUADRAT	9	Subplot number
SUBP	SOILS_EROSION	7	Subplot number
SUBP (13.4.1)	VEG_SUBPLOT	8	Subplot number
SUBP	VEG_SUBPLOT_SPP	10	Subplot number
SUBP_ACCESSIBLE_FOREST_PCT (13.4.4)	VEG_SUBPLOT	11	Subplot accessible forest percent
SUM_ABUNDANCE	LICHEN_SPECIES_SUMMARY	9	Sum of abundance
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
SZCLSCD1 (10.3.22)	LICHEN_VISIT	31	Size class code
SZCLSCD2 (10.3.22)	LICHEN_VISIT	32	Size class code
SZCLSCD3 (10.3.22)	LICHEN_VISIT	33	Size class code
TALLSHRB (10.3.21.3)	LICHEN_VISIT	22	Tall shrubs
TERRPOS (9.4.12)	OZONE_PLOT_SUMMARY	14	Terrain position
TERRPOS (9.4.12)	OZONE_SPECIES_SUMMARY	25	Terrain position
TERRPOS (9.4.12)	OZONE_VISIT	15	Terrain position
TOTAL_CANOPY_COVER_LAYER_1 (13.5.1)	VEG_SUBPLOT	14	Total canopy cover layer 1

Column name and field guide section	Table name	Location in table	Description
TOTAL_CANOPY_COVER_LAYER_2 (13.5.2)	VEG_SUBPLOT	15	Total canopy cover layer 2
TOTAL_CANOPY_COVER_LAYER_3 (13.5.3)	VEG_SUBPLOT	16	Total canopy cover layer 3
TOTAL_CANOPY_COVER_LAYER_4 (13.5.4)	VEG_SUBPLOT	17	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 (14.4.3.6.1)	DWM_COARSE_WOODY_DEBRIS	14	Transect diameter
TRANSECT (14.4.3.2)	DWM_COARSE_WOODY_DEBRIS	8	Subplot transect (deg)
TRANSECT (14.6.4)	DWM_DUFF_LITTER_FUEL	7	Subplot transect (deg)
TRANSECT	DWM_FINE_WOODY_DEBRIS	7	Subplot transect (deg)
TRANSECT (14.3.2)	DWM_TRANSECT_SEGMENT	8	Subplot transect (deg)
TRASH_JUNK_COVER_PCT (13.6.10)	VEG_SUBPLOT	27	Trash/junk/other ground cover percent
TXTRLYR1 (11.7.21)	SOILS_SAMPLE_LOC	21	Soil texture layer
TXTRLYR2 (11.7.22)	SOILS_SAMPLE_LOC	22	Soil texture layer
TYPAREACD (11.6.5)	SOILS_EROSION	13	Compacted area code
TYPCMPCD (11.6.4)	SOILS_EROSION	12	Compacted trail code
TYPOTHRCD (11.6.6)	SOILS_EROSION	14	Other type of compaction code
TYPRTDCD (11.6.3)	SOILS_EROSION	11	Rutted trail code
UNIQUE_SP_NBR (13.8.1.2)	VEG_PLOT_SPECIES	9	Unique species number
UNIQUE_SP_NBR (13.8.1.2)	VEG_SUBPLOT_SPP	12	Unique species number
UNITCD	OZONE_PLOT	6	Unit code
VEG_CREW_TYPE (13.3.5)	VEG_VISIT	14	Vegetation crew type
VEG_FLDSPCD (13.8.1.1)	VEG_PLOT_SPECIES	8	Veg field species code
VEG_FLDSPCD (13.8.1.1)	VEG_SUBPLOT_SPP	11	Veg field species code
VEG_KINDCD	VEG_VISIT	8	Vegetation sample kind
VEG_MANUAL	VEG_VISIT	9	Vegetation 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

Column name and field guide section	Table name	Location in table	Description
VEG_QA_STATUS (13.3.4)	VEG_VISIT	7	Vegetation quality assurance status code
VEG_SAMPLE_BASIS	VEG_VISIT	16	Vegetation sample basis
VEG_SPCD	VEG_PLOT_SPECIES	10	Vegetation Species Code
VEG_SPCD	VEG_SUBPLOT_SPP	13	Vegetation species code
VEG_SUBP_NONSAMPLE_REAS N_CD (13.4.3)	VEG_SUBPLOT	10	Vegetation subplot nonsampled reason code
VEG_SUBP_NONSMP_RSN_CD_P RE2004	VEG_SUBPLOT	30	Vegetation subplot nonsampled reason code, prior to 2004
VEG_SUBP_STATUS_CD (13.4.2)	VEG_SUBPLOT	9	Vegetation subplot status code
VEG_SUBP_STATUS_CD_PRE200 4	VEG_SUBPLOT	29	Vegetation subplot status code, prior to 2004
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 (11.7.10)	SOILS_LAB	8	Visit number
VSTNBR (11.7.10)	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
VVT_CN	VEG_SUBPLOT	3	Vegetation visit sequence number
VVT_CN	VEG_SUBPLOT_SPP	3	Vegetation visit sequence number
WIDTH1 (14.8.7)	DWM_RESIDUAL_PILE	15	Pile width1 (ft)
WIDTH2 (14.8.8)	DWM_RESIDUAL_PILE	18	Pile width2 (ft)
WOOD_COVER_PCT	VEG_SUBPLOT	28	Wood ground cover percent
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