Version 2.0

The PNW-FIA Integrated Database
Periodic Inventory Data

The ***Integrated DataBase (IDB)*** combines data from eight different forest inventories conducted by the Forest Service and the Bureau of Land Management in California, Oregon, and Washington. These inventories were organized and executed by five individual forest inventory programs from two agencies, including the Forest Inventory and Analysis (FIA) program of the Pacific Northwest Research Station (PNWFIA), the Interior West FIA program of the Rocky Mountain Research Station (RMRS), the Continuous Vegetation Survey program of the Pacific Northwest Region (R6, Region 6), the Forest Inventory program of the Pacific Southwest Region (R5, Region 5), and the Natural Resource Inventory program of the Bureau of Land Management (BLMWO, western Oregon districts only). The eight inventories include Western Oregon, Eastern Oregon, California, Western Washington, and Eastern Washington from PNWFIA, California from R5, Oregon and Washington (as one inventory) from R6, and Western Oregon from BLM. Note that PNWFIA collects data on all BLM lands except those in western Oregon; and RMRS collects data on National Forest land in Washington (Kaniksu NF, R1) and California (Toiyabe NF, R4).

The PNW Forest Inventory and Analysis program receives many requests for comprehensive forest inventory data (both raw and summarized) for Pacific Northwest states. Although a wealth of information has been collected in the many forest inventories conducted in the West, data are often stored in a number of different databases with a variety of formats and database designs. Even inventories conducted by PNWFIA are similar but not identical in format and database structure.   PNWFIA has recognized the need for a database that integrates technical information about western forests across owners and states. In response to the high demand for forest inventory data, a database was developed (the PNWFIA-Integrated Database, or "IDB") from the most recently completed inventories available from the National Forest System, BLM, and PNWFIA (Table 1). Data acquired from each inventory program were transformed into databases with a common set of formats, definitions, codes, measurement units, column names, and table structures.

When possible, the National Forest and BLM data were compiled with the same procedures, algorithms, equations, and calculation methods that were used to compile the PNWFIA inventory data. In some cases it was not possible to use the same equation or procedure for a calculated variable because all the necessary data was not available in the NFS or BLM databases for that particular PNWFIA equation. However, the majority of compiled data were calculated in exactly the same way across all inventory databases.

The result is an integrated database, where items such as net volume, current annual growth, or forest type are calculated with the same methods. Our goal was to produce a database that is easy to use, well documented, and standardized across owners and states.

Table 1. Source and Dates of Forest Inventory Data

Data Source	Data source name	Primary States	Dates of Inventory	Density of sample grid for plot selection *
R5	Region 5, Pacific Southwest	CA	1993-2000	Numerous
R6	Region 6, Pacific Northwest	OR, WA	1993-1997	1.7 mi (3.4 mi in wilderness)
BLMWO	Bureau of Land Management	Western OR	1997	3.4 mile
FIAEO	FIA, Eastern Oregon	OR	1998-1999	3.4 mile
FIAWO	FIA, Western Oregon	OR	1995-1997	3.4 mile
FIACA	FIA, California	CA	1991-1994	3.4 mi (4.8 mi in oak woodland)
FIAEW	FIA, Eastern Washington	WA	1990-1991	3.4 mile
FIAWW	FIA, Western Washington	WA	1988-1990	2.4 mile
RMRS	FIA, Interior West	CA, WA		3.1 mile
* The GRID_WT_FAC in the COND table has a value representing the grid intensity				

Inventory designs varied in the type of information collected on each plot. In general, the newer FIA inventories (FIAEO, FIAWO) and all National Forest and BLM inventories (R5, R6, BLMWO) collected tree data on all forest lands and sampled reserved areas. In contrast, earlier FIA inventories (FIACA, FIAEW, FIAWW) were focused on timberland or, if other-forest land was sampled for trees, plots were selected off of a lower density grid. Table 2 below shows the type of land class and reserved status that were sampled in each inventory. **It is important to be aware that some FIA inventories do not have tree-level information on some forest land classes.**

Other-forest land plots in the older FIA inventories that were not sampled for trees, were evaluated on aerial photographs. A small amount of data was collected off of the photos and other sources, in order to provide basic classification information for the plot. This smaller set of data was entered into the PLOT and COND table, and includes items like land class, owner, general forest type, reserved status, aspect, and elevation.

The IDB also contains proxy ('dummy') records to represent reserved areas that were not sampled in the FIACA, FIAEW, and FIAWW inventories. FIA obtained the reserved information from the primary sample (photo-interpretation), maps, and other sources. These proxy records have a limited amount of data on them, including items such as state, county, plot number, owner, forest type (if available), and acres. The addition of these records allows users to develop correct estimates of total forest land area in queries and analyses.

In addition, large blocks of nonforest land and some forest land were not sampled with plots in FIA inventories. Instead, the area was digitized on maps and estimates for each county were developed by FIA staff, and entered as one or more proxy record(s) in the IDB.

Note that the proxy records in FIA inventories can have large expansion factors (ACRES) because they represent large unsampled areas and not individual plots. Proxy records are identified in the PLOT table by the column PROXY_YN = Y.

Proxy records do not have coordinates associated with them.

Table 2. Information about the type of land that was sampled in each inventory.

Data Source	Land classes sampled for trees	Ground Land Class codes	Reserved lands sampled?	Comment
R5	All forest land	20, 40's	Yes	
R6	All forest land	20, 40's	Yes	
BLMWO	All forest land	20, 40's	Yes	
FIAEO	All forest land	20, 40's	Yes	Not all Juniper forest land was sampled
FIAWO	All forest land	20, 40's	Yes	
FIACA	Timberland and partial sample of woodland (other forest,44)	20, 44, 49	No	Not all Woodland forest land was sampled
FIAEW	Forest land	20, 40's	No	
FIAWW	Timberland only	20, 49	No	'Other-forest' or 'Unproductive forest' were not sampled
RMRS	All forest land	20's, 40's	Yes	

New to Version 2.0
Data from the Toiyabe National Forest in California and the Kaniksu National Forest in Washington were added to the IDB. For FIAEO, data from the Juniper inventory were added, where juniper forest land plots (GLC=43) on the east side of the Cascades were measured.

Area and Volume Expansion
When summarizing the amount of land area within a category of interest, the ACRES column should be used (the exception to this is discussed below for FIACA woodland plots). When summarizing volume (or other tree-level, per-acre attribute), the ACRES_VOL column should be used to expand the per-acre value.
For example, Net cubic volume = VOL_AC_NET_FT3 * ACRES_VOL.

ACRES column
Each condition class on a plot represents a certain amount of acres in the broad inventory area. ACRES is used to summarize the amount of land area within a given category (i.e. owner, forest type, state, national forest). ACRES is an estimate of land area based on various stratification schemes and methods that were appropriate for each inventory. Each DATA_SOURCE (R5, R6, BLMWO, and FIA) used slightly different techniques to develop an estimate for this column. FIA ACRES were calculated by FIA staff at the time of the original compilation. The IDB staff used stratification information provided by R5, R6, and BLMWO staff to calculate plot and condition class acres for NFS and BLM inventories.

For R6, land area estimates published on the national website that tracks national forest land area (both proclaimed and administered) for each county in the country were used to stratify the plots. This method allows the total land area to match Bureau of Census figures for a given county. The stratification uses the amount of Proclaimed acres of total National Forest land within each county, summarized by wilderness and non-wilderness areas. The total number of NF plots within wilderness or non-wilderness locations in each county were divided into the total NF land area within the county (irregardless of specific National Forest) to derive the acres per plot. Users can then summarize the amount of acres using the Administered National Forest code (FOREST_OR_BLM_DISTRICT column), which is the most common way to analyze and report NFS data. Please see the technical document "Area_Expansion_R6_BLMWO.doc" for

more information. The goal has always been to match the total acres per county in the IDB with the county land area published in the 1990 Bureau of Census reports (because inventory data were collected in the 90's).

For BLMWO, a count was made of the total number of plots in each county in the BLM database. Total land area by county was summarized from the 1995-1998 FIA inventory of western Oregon, for land owned by the BLM. The plot count was divided into the county area to derive the acres per plot, which was multiplied by the COND_WT to estimate ACRES. Please see the document "Area_Expansion_R6_BLMWO.doc" for more information.

For R5, condition class acres were estimated from strata on map-based GIS layers. A count of subplots was divided into the area of mapped vegetative strata to estimate acres per subplot, which was multiplied by the number of subplots per condition to calculate ACRES.

For FIA, stratification schemes varied by half-state and in general, included owner, land class, county, and survey unit as stratum identifiers. Plot counts within strata were divided into the stratum area to create an estimate of acres per plot, which was multiplied by the COND_WT to estimate ACRES.

The sum of the ACRES across all conditions on one plot equals the acres represented by the individual plot location. Each row in the COND table has an estimate of land area (ACRES) associated with that condition on the plot.

ACRES_VOL column
ACRES_VOL is an area expansion factor used specifically to expand each per-acre column such as volume/acre or biomass/acre, to develop an estimate of population totals for an attribute of interest. Volume/acre estimates are available for a wide variety of live and dead tree attributes such as whole tree volume, merchantable volume, current annual growth volume, mortality volume, gross volume, net volume, etc. Biomass/acre estimates include above ground woody biomass, branch biomass, bark biomass, and bole biomass.   Per-acre estimates are also available for down wood data, which should be summarized to the condition level before expansion.

 To expand any per-acre column, multiply the column by the ACRES_VOL column as follows:
Attribute of interest = attribute/acre * ACRES_VOL
For example, Volume= volume/ac * ACRES_VOL or Biomass=biomass/ac * ACRES_VOL

The result provides an estimate of what the tree or piece of down wood represents across the inventory area (population totals). In many cases, ACRES equals ACRES_VOL. When these columns are different, it indicates that a different stratification scheme or sampling design was used to provide a more accurate estimate of tree volume or biomass. When ACRES_VOL contains a value, it indicates that the condition and plot were intentionally sampled for trees or down wood.

It is important to use ACRES_VOL every time a per-acre attribute is expanded.

Expansion of Tree Mortality data
Dead trees that are recent mortality are stored in the TREE_MORT table. A mortality tree is a dead tree that has died within the past 5 or 10 years of the current inventory date. The TREE_MORT table includes information about trees that died within the last 5 years (for R5, R6 and BLMWO) and trees that died during the FIA remeasurement period (about 10 years for FIACA, FIAEO, FIAWO, FIAWW, FIAEW). Note that for FIA, a mortality tree **may or may not** be standing. For NFS and BLM inventories, there was no previous measurement, so a recent mortality tree was estimated by field crews to have died sometime within the 5 years prior to the current inventory. All mortality trees for NFS and BLM are standing dead.

Some important points need to be made about the use of mortality data on FIA plots. Mortality was tallied on remeasured (or reconstructed) subplots and conditions only. Because the design has changed over time, new subplots were installed in a different configuration. The inventories in the IDB contain the most recent measurement of inventory plots, including the subplots newly installed. Mortality was not measured on these new subplots in FIA inventories. In addition, mortality was only measured on condition class 1 – which was the condition installed and measured at the previous inventory. In the western Washington FIA inventory, half of the plots were not sampled for mortality.

This requires a different area expansion factor to be used when expanding the per-acre tree estimates to population totals.

The correct area expansion factor to use for mortality data in the TREE_MORT table is found in the COND table and called ACRES_VOL_MORT.

For example: Mortality volume in cubic feet = VOL_AC_GRS_FT3 * ACRES_VOL_MORT

Because mortality trees were not measured on every subplot and every condition, it may be more appropriate to use a weighted mean of the per-acre estimates, rather than expanding them to a population estimate.

California's woodland inventory conducted by FIA
The FIACA inventory sampled all types of land classes on a 3.4-mile grid. Trees were measured on every timberland plot (GLC=20,49) and on a partial sample of all woodland (GLC=44) plots. Because of the partial sample, a different stratification scheme was used on the woodland plots, resulting in a second area expansion factor which must be used to expand all per-acre tree-level estimates (i.e. volume/acre) and to summarize most area information. IDB users need to be aware that the expansion factor called ACRES_VOL must be used when some area summaries are run for woodland land classes. Specifically, if columns that are based on tree data (forest type or stand size) are used to group data, the ACRES_VOL must be used. If a broader summary of forest land by land class is done (where forest type, etc are not used), the ACRES column can be used.

Summaries at the county level
If a summary is needed at the county level, link the COND_EXTRA table to the COND table by the COND_ID column, and use the expansion factors called ACRES_CNTY or ACRES_CNTY_VOL. Most FIA and all NFS inventories were designed at the Survey Unit level (group of contiguous counties) or National Forest level. The expansion factors ACRES or ACRES_VOL were developed from a stratification at these levels, and provide the most accurate estimates of area, volume, biomass, numbers of trees, etc for the population. For FIA inventories, a second stratification was conducted that incorporated county into the process. This

stratification resulted in the second set of expansion factors (ACRES_CNTY or ACRES_CNTY_VOL), which provide better population estimates for a given county. However, standard errors are known to be higher at the county level because the sample size per county (number of plots) is often insufficient to produce reliable results.   In summary, the primary use of the inventory data in the IDB should be to provide information at the survey unit, state, National Forest, or BLM district level – which was how the inventories were originally designed. Users should be aware that summaries at the county level are possible (using the COND_EXTRA table) but the estimates are likely to be less reliable with larger standard errors.

 Note that FIA Oregon inventories and the BLM inventory included county as a component of the main stratification, therefore the ACRES and ACRES_VOL can be used reliably to develop county level estimates. A second county level stratification was not done on NFS lands, therefore the ACRES_CNTY or ACRES_CNTY_VOL are the same as ACRES or ACRES_VOL. For ease of use, the COND_EXTRA table contains entries for every record in the COND table, however only FIA and BLM inventories were actually stratified by county to create these expansion factors .

Calculating a weighted average

When calculating an average per-unit area estimate with inventory data, it should be weighted by the sampling grid density and the size of the condition class area where the tree or down wood was sampled. The weighting factor called SAMPLING_WT_FAC on the COND table should be used as the weight for all data except tree mortality data. When working with data in the TREE_MORT table, the weight called SAMPLING_WT_MORT_FAC should be used.

Weighted means are normally calculated as follows:

Weighted mean =   (sum of SAMPLING_WT_FAC * Per-Acre Value) /
                   (sum of SAMPLING_WT_FAC)
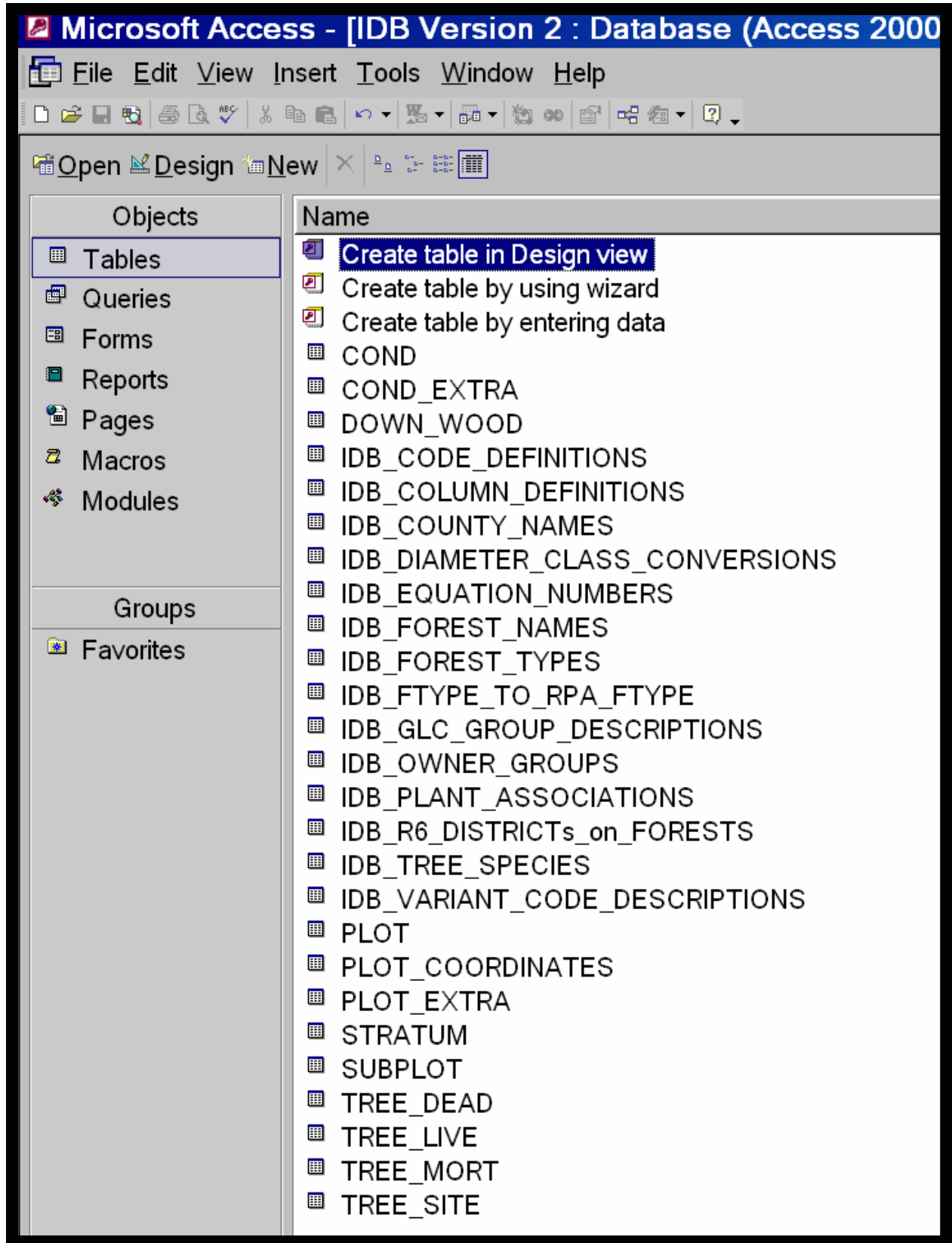
where SAMPLING_WT_FAC = (GRID_WT_FAC * COND_WT)

Size of the IDB

Version 2.0 of the IDB contains over 28,000 plot locations and over 1.2 million tree records as shown in Table 3 below.

Table 3. Number of records in some database tables by data source.

DATA SOURCE	Number of plot records PLOT	Number of condition class records COND	Number of Live Tree records TREE_LIVE	Number of Standing Dead Tree records (Snags) TREE_DEAD	Number of Down wood records (CWD) DOWN_WOOD
R5	4,722	5,324	177,312	33,831	50,714
R6	11,301	14,386	933,458	146,787	126,406
BLMWO	323	348	26,575	2,752	3,071
FIAEO	1,149	1,604	13,764	1,233	12,896
FIAWO	1,509	2,732	23,131	2,359	26,220
FIACA	4,914	7,587	53,979	2,554	17,950
FIAEW	1,337	1,375	11,662	954	15,351
FIAWW	2,903	3001	42,890	4,436	Not sampled
RMRS	204	209	3,499	869	Not sampled
Total IDB	28,362	36,566	1,286,270	195,775	252,608

Note: There were 8 plots in the BLMWO database that were not included in the IDB because they are in a county that was sampled in the FIAEO inventory. Individual census water plots are not in this database. Instead, a proxy plot was entered for each county, containing the amount of census water reported by the 1990 Bureau of Census.

TABLES IN THE IDB:

Microsoft Access - [IDB Version 2 : Database (Access 2000

File   Edit   View   Insert   Tools   Window   Help

Open   Design   New

Objects

- Tables
- Queries
- Forms
- Reports
- Pages
- Macros
- Modules

Groups

- Favorites

Name

- Create table in Design view
- Create table by using wizard
- Create table by entering data
- COND
- COND_EXTRA
- DOWN_WOOD
- IDB_CODE_DEFINITIONS
- IDB_COLUMN_DEFINITIONS
- IDB_COUNTY_NAMES
- IDB_DIAMETER_CLASS_CONVERSIONS
- IDB_EQUATION_NUMBERS
- IDB_FOREST_NAMES
- IDB_FOREST_TYPES
- IDB_FTYPE_TO_RPA_FTYPE
- IDB_GLC_GROUP_DESCRIPTIONS
- IDB_OWNER_GROUPS
- IDB_PLANT_ASSOCIATIONS
- IDB_R6_DISTRICTs_on_FORESTS
- IDB_TREE_SPECIES
- IDB_VARIANT_CODE_DESCRIPTIONS
- PLOT
- PLOT_COORDINATES
- PLOT_EXTRA
- STRATUM
- SUBPLOT
- TREE_DEAD
- TREE_LIVE
- TREE_MORT
- TREE_SITE

User Documentation

The database contains a group of tables, forms, queries, and reports that allow users to view, search, sort, and print the documentation for code and column definitions. The code and column definitions are stored in standard database tables, alongside the inventory data. The IDB contains an easy to read and use Form that helps users view and browse the definitions. This Form combines both the code and column database tables and displays them on the screen. If the Form is loaded at the beginning of a database session and then minimized, the user can quickly switch to the form if a question arises about a column definition or about the valid codes for a particular column.

To view code and column definitions onscreen, use the Form:
IDB_DOCUMENTATION_CODE_and_COLUMN_DEFINITIONS
It is convenient to have this form loaded as you work with the database, because you can quickly switch to the Form to look up a definition or a set of codes for a column when needed.

PNW - FIA Integrated Database IDB Column and Code Definitions

IDB COLUMN NAME: ACRES   Scroll Or Type Name To Find the Column   Exit

Column Information | Code Definitions

IDB TABLE NAMES:	MEASUREMENT UNITS:	DATA TYPE:	Is the value coded?
COND	acres	real number (decimal)	No

If Yes, Click Code Definitons Tab

DESCRIPTION:
Condition class acres. The number of acres the condition represents in the inventory.

DEFINITION:
Each condition class on a plot represents a certain amount of acres in the broad inventory area. ACRES is used to summarize the amount of land area within a given category (i.e. owner, forest type, state, county, national forest). ACRES is an estimate of land area based on various stratification schemes and methods that were appropriate for each inventory. Each DATA_SOURCE (R5, R6, BLMWO, and FIA) used slightly different techniques to develop an estimate for this column. FIA ACRES were calculated by FIA staff at the time of the original compilation. The IDB staff used stratification information provided by R5, R6, and BLMWO staff to calculate plot and condition class acres for NFS

Note that there are 2 tabs: one for the column definition (Column Information tab) and one for the list of valid codes (Code Definition tab). If the "Is the value coded?" box = 'yes' there will be codes shown in the codes tab. Click on this tab and the list of codes along with a brief definition will be displayed. This is an easy way to quickly see the specific documentation for a given column.

PNW - FIA Integrated Database IDB Column and Code Definitions

IDB COLUMN NAME: OWNER   Scroll Or Type Name To Find the Column   Exit

Column Information | **Code Definitions**

CODE_VALUE	SHORT_DEF
11	National Forests
21	National Park Service
22	Bureau of Land Management
23	Fish and Wildlife Service
24	Department of Defense or Energy
25	Other federal owner
31	State
32	Local Government (county, municipal)
33	Other non-federal public
46	Private

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To print column definitions use the Report Writer: **IDB COLUMN DEFINITION REPORT**
To print code definitions use the Report Writer: **IDB CODE DEFINITION REPORT**
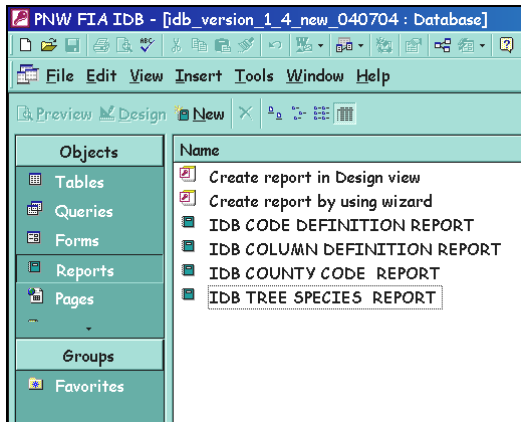
The output from the reports above have been stored as Adobe PDF files in the User Documentation directory on the CD. In addition, there is a PDF file that contains information about the structure of each database table, including the column name, measurement units, coded information, and the data type. The following documentation files can be printed to serve as a reference while using the IDB:

1_IDB_Vers2 _User Guide Color Coverpage.doc
2_IDB_Vers2_User Guide.doc
3_IDB_Vers2_TABLE_STRUCTURE.pdf
4_IDB_Vers2_COLUMN_LIST.pdf
5_IDB_Vers2_CODE_LIST.pdf
6_IDB_Vers2_COLUMN DEFINITIONS.pdf

Technical Documentation

The directory called "technical documentation" contains a variety of documents that describe procedures used to calculate some of the data in the database. The goal of the IDB was to compile the calculated fields in the same way across inventories, whenever possible, using FIA procedures and methods. Because of inherent differences in inventory designs and collection techniques, this goal was not always attainable. In some cases, IDB staff went to other sources (i.e. FVS programs) to locate an appropriate equation or method for the National Forest and BLM data. These methods are described and documented. The technical documentation also includes all volume, stocking, biomass, and site index equations used in this database. IDB staff will continue to update, enhance, and add new technical documents over time.

IDB TABLE STRUCTURE AND RELATIONSHIPS

Database Tables

The current set of inventory tables includes:

PLOT	-General information about the sample plot
COND	-Condition class data, multiple conditions (rows) possible on a plot
TREE_LIVE	-Live tree data, including seedlings
TREE_DEAD	-Standing dead trees, died from all causes
TREE_MORT	-Recent mortality – trees that died from natural causes within 5-10 years (may be standing, down, or gone)
TREE_SITE	-Live tree data, high quality trees measured as site trees
DOWN_WOOD	-Down wood data >= 3" in diameter
SUBPLOT	-Subplot data, one row per condition per subplot on the plot
STRATUM	-Stratification information
PLOT_COORDINATES	-Contains fuzzed coordinates for each plot location
PLOT_EXTRA	-Additional information for each plot
COND_EXTRA	-Additional information for each condition

There are also many metadata tables in the database that contain crosswalks of codes to a text name or description. For example, there is a table that contains the numeric species code, common name, and scientific name. These tables are useful to include in a query or report, so the actual text name is displayed instead of a numeric code.

The following metadata tables are available in Version 2.0 of the IDB. More tables will be added to this group as relevant information or data become available. These tables can be linked to the inventory data tables via the appropriate numeric code to provide text names for things like tree species, counties, survey unit, state, National Forests, NFS and BLM districts, variants, owner and more.
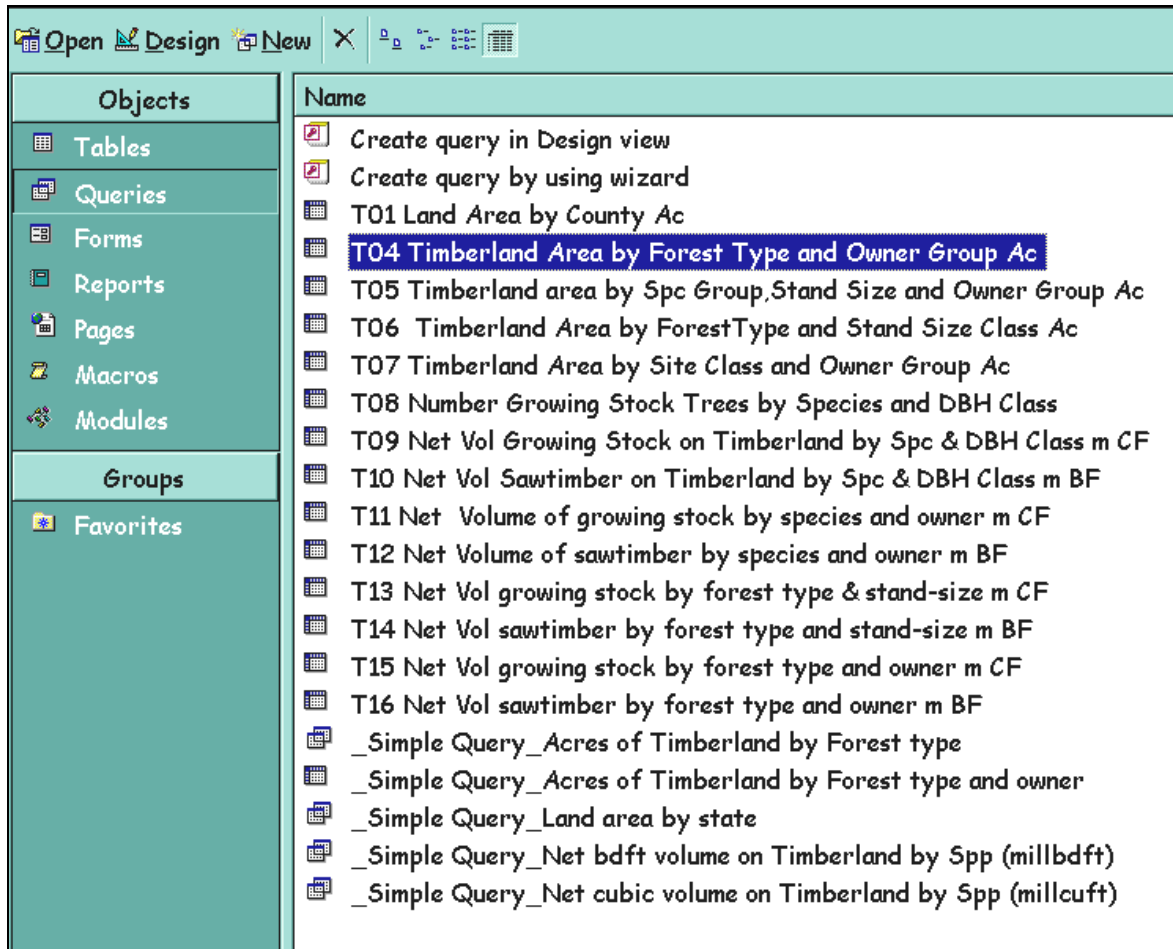
Metadata tables in the IDB:
IDB_COUNTY_NAMES
IDB_DIAMETER_CLASS_CONVERSIONS
IDB_EQUATION_NUMBERS
IDB_FOREST_TYPES
IDB_FOREST_NAMES
IDB_FTYPE_TO_RPA_FTYPE
IDB_GLC_GROUP_DESCRIPTIONS
IDB_OWNER_GROUPS
IDB_PLANT_ASSOCIATIONS
IDB_R6_DISTRICTS_ON_FORESTS
IDB_TREE_SPECIES
IDB_VARIANT_CODE_DESCRIPTIONS

Queries

The IDB contains a variety of queries to summarize area and volume data within a number of different categories. Open the queries in design mode and enter selection criteria for areas of interest such as state, halfstate, national forest, data source, etc. See the code definitions for the appropriate codes to use. Queries also format and display code and column documentation.

Some of the queries are shown below:

The database has all necessary relationships established and pre-joined among all the inventory tables in the database. The naming convention for KEY fields in this is database is as follows: Each table has an ID field, which is a unique number for every row in the entire table. The name of the column always includes the table name before the word ID.

The following list shows the primary key field in each table:

Table Name	Key field (unique row identifier)
PLOT	PLOT_ID
COND	COND_ID
TREE_LIVE	TREE_LIVE_ID
TREE_DEAD	TREE_DEAD_ID
TREE_MORT	TREE_MORT_ID
TREE_SITE	TREE_SITE_ID
DOWN_WOOD	DOWN_WOOD_ID
SUBPLOT	SUBPLOT_ID
STRATUM	STRATUM_ID
PLOT_COORDINATES	PLOT_ID
PLOT_EXTRA	PLOT_ID
COND_EXTRA	COND_ID

The **COND_ID** is the most commonly used KEY field in the database. This field is a unique number for every condition record in the COND table, and is required for most joins that users will make. It is present in every table except the plot level tables (see figure 1 below).

The ALLTREE_ID is a sequential number that uniquely identifies each individual tree (live and dead) in the entire database. This ID was created because there was overlap and duplication of individual trees among some tree tables. A live tree can also be a site tree, and a mortality tree can also be a snag. The ALLTREE_ID uniquely identifies all individual trees across all DATA_SOURCES and tables. This number allows users to combine live and dead trees if desired, and still retain a unique ID for the new table. If one tree is also in another table, both records will have the same ALLTREE_ID.

PLOT_ID is a sequential number that uniquely identifies each plot (row) in the entire PLOT table. **It is recommended that PLOT_ID be used when summarizing or grouping data by plot, because the original plot numbers (PLOT) are <u>not unique</u> in the database.** For example, in FIA data, a plot number is unique within state and county; for R5 it is unique within region and National Forest; and for R6 plot number is unique for the entire region. People familiar with FIA data should note that the combination of state, county and plot are <u>not unique</u> across all inventories in the IDB, and will not identify an individual plot location.

Because of this variability in uniqueness from the many data sources in this database, it is recommended that the column PLOT_ID be used to uniquely identify every plot location in this database. This ID is unique across all data sources and all inventories.

In previous versions of the IDB, the PLOT table was the only place where the original plot number is stored**. However, for convenience, the PLOT, CNTY, STATE, FOREST_OR_BLM_DISTRICT, and COND_CLASS codes were added to the COND, TREE_LIVE, TREE_DEAD, and DOWN_WOOD table.**

Remember that the PLOT_ ID and COND_ID are the best fields to link tables together.

For users who wish to link tables by columns other than the PLOT_ ID and COND_ID, use the following combination of columns for different data sources:

All FIA: link on STATE, CTY, PLOT, COND_CLASS
R6 and BLMWO: link on PLOT and COND_CLASS
R5: link on FOREST_OR_BLM_DISTRICT, PLOT, and COND_CLASS

All the relationships are predefined to insure that tables are automatically linked by the appropriate KEY field when the user creates new queries. If a new table is created by the user, the relationships must be re-established manually by dragging a line from one ID to another ID in a second table.

Figure 1 below illustrates the IDB table relationships with KEY fields. All relationships have been pre-linked within Access, reducing potential errors when developing queries or reports. However, if new tables are created during an analysis of the data, the links will be lost.
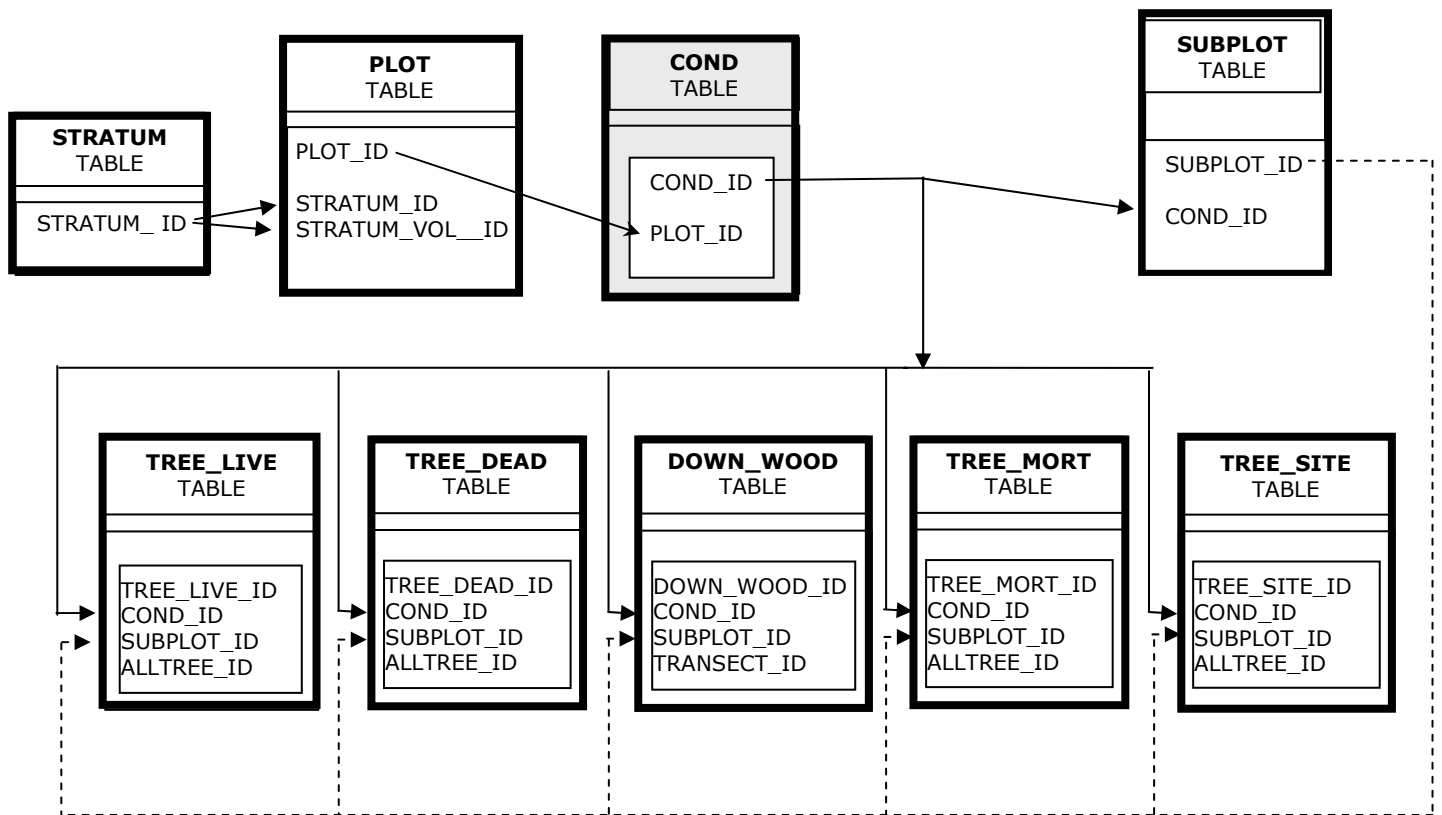
The most common link is between COND and each of the 5 tree or down wood tables.

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Seedlings

Seedlings are live trees < 1 inch in diameter, and identified by the column SEEDLING_YN=Y.
For R5, R6, and BLMWO, seedlings were group counted during data collection and entered into
the live tree database as one line of data. Trees/acre was calculated for each seedling group by
first calculating the value for 1 seedling and then multiplying this value by the seedling count.
This expanded value is stored in the database, therefore some seedling data may appear to be
unusually large in comparison with other tree data. Each seedling has a stocking value
calculated for it, which has been converted to a stocking estimate for the seedling group.

Confidentiality

FIA is mandated by Law (Privacy Amendment: H.R.3423 Department of the Interior and Related
Agencies Appropriations Act, 2000 (November 17, 1999)) not to disclose any information that
can be tied back to an individual landowner. For this reason we can not give the actual true plot
locations out to anyone, because they might be able to use GIS or tax records to ascertain the
individual owner of the plot. We use a randomized offset for each plot to mask the true location.
This is called fuzzing. For all plots in the IDB that are on lands in public ownership (such as
State, Federal and municipal), we randomly offset the coordinates up to 1/2 mile in any direction.
We further randomly selected 5% of these plots and offset them by up to 1 mile (instead of the
1/2 mile). Plots in the IDB that are on privately owned lands were fuzzed to 100 seconds of
latitude and longitude, which is up to about 2 miles. Using this method, plots were not allowed
to jump county lines when we fuzzed the coordinates.

Simply fuzzing the plot coordinates does not truly protect us from disclosing data that could be
tied to an individual owner, and thus does not comply with the law. For instance, a plot offset by
a half mile (or even two miles) in the center of the Warm Springs Reservation would still be in
the Reservation, so all data associated with that plot could be tied to an individual owner, in this
case the Consolidated Tribes of the Warm Springs. So, the data for a percentage of the IDB plots
on privately owned lands have been swapped with the data from a similar plot in the county. In
this way, there is always a chance that the data can not be tied back to the single owner, even
with a GIS system, thus FIA would still be complying with the law.

The swapping method was designed to minimize the affects on analysis. And since no plots are
allowed to move to another county, analysis at the county level will not be affected. However, a
group of plots from a part of a county might show effects of fuzzing and swapping, with the
fewer the number of plots chosen, the greater the possible effect.

The 'fuzzed' coordinates have been included in the IDB and are stored in the
PLOT_COORDINATES table. There is one set of latitude and longitude coordinates for each
plot record, except for the PROXY plots. Since PROXY plots are essentially placeholders for
estimated unsampled area in the inventory, they are not actual plots.

If exact plot coordinates are needed, please contact the FIA program in Portland, OR to
determine if we can accommodate your request. Specific protocols for the use of FIA
coordinates have been established, and permission is granted on a case by case basis.

In addition to the fuzzing of coordinates, the ownership data for private owners in the IDB have
been grouped into a general code of 'private'.
For more information on this issue, contact Dale Weyermann (503-808-2042) or the Program
Manager, Susan Willits (503-808-2066).

<u>Use of the STRATUM table</u>
The STRATUM table contains all the necessary data and information about each strata for each inventory (DATA_SOURCE).   This table is required to correctly estimate variance or standard errors for an area or volume summary. This table is especially important when working with FIA data because it provides information on both the primary and secondary samples of the double-sample for stratification inventory design.

If you are working with an area summary table, link the STRATUM_ID in the STRATUM table to the STRATUM_ID in the PLOT table.

 If you are working with a volume summary table, link the STRATUM_ID in the STRATUM table to the STRATUM_VOL_ID in the PLOT table.

For an extensive discussion of statistical methods for estimating population totals, means, and associated standard errors for each inventory in the IDB, please read the IDB document called Alternative_Estimation_procedures.doc. This document contains a publication (in press) by Tara Barrett entitled **Estimation procedures for the combined 1990s periodic inventories of California, Oregon, and Washington.**

For more information on the use of the STRATUM table, please contact Tara Barrett, Research Biometrician (503-808-2041).

Contents of the Integrated Database CD

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UP6_Update Notice for Version 2.0.doc
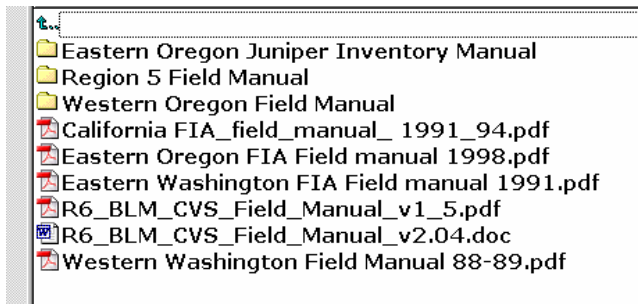Intro Letter.doc
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5_IDB_Vers2_CODE_LIST.pdf
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Technical Documentation V 2.0

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Area_Expansion_R6_BLMWO.doc
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TREE SPECIES AND SPECIFIC GRAVITY.doc
Volume equations.doc