Forest Service Handbook
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Forest Service Handbook 2409.13a – Timber Permanent Plot Handbook

Chapter 20 - Core Information

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Approved by: F. Dale Robertson, Chief

Date approved:

Responsible Staff:

Last Change:

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Digest: Following is an explanation of the changes throughout the directive by section.

2409.13a: Establishes new Handbook, FSH 2409.13a, Timber Permanent Plot Handbook, outlining direction on establishing permanent plots for sharing of timber growth and yield information. It requires consistent and standard information to be collected on permanent plots that are established for growth and yield modeling.

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20.3 - Policy

A set of core information, consisting of required data, will be collected and recorded for all plots established to measure and monitor timber growth and yield. This core information shall be complete and consistent across administrative units to provide sharing of data, information, and experiences. The data will be stored with the unit collecting the information and made available to other units for growth and yield analyses, studies, and projections.

21 - Implementation

Collect the required data and information according to the definitions and standards specified in the Timber Management Information System Handbook, FSH 2409.14. If definitions are not available in FSH 2409.14, consult the Interim Resource Inventory Glossary and sec. 22 and 23. Also, develop the capabilities of converting existing data to provide the required data to national specifications given in FSH 2409.14.

22 - Required Information

The following data and information are required for all newly established or remeasured growth and yield permanent plots to ensure a common set of information across all administrative units. The required information may be included in the implementation plan, collected on the permanent plots or stored in the database. Record the information in sections 22.1 through 22.5 for each plot or observation on the appropriate field forms.

22.1 - Control Variables

The following information is required to describe where and how the data are collected:

1. Cluster/Transect/Plot Number. Record where applicable.

2. Datum Source. Note the source of the vegetation data, such as measurement, observation, or calculation for appropriate vegetation variables or document in implementation plan.

3. Location Identification Number. Record the unique number identifying the plot, site, or stand for which data are collected and stored.

4. Location Coordinates. Consult FSH 2409.14 for definitions and standards. If none is available, record the latitude and longitude or the Universal Transverse Mercator (UTM) coordinates, or have the capability to convert the coordinates that are used to one of the recommended systems.

5. Measurement Date. Record, at a minimum, the year and month for the data recorded.

6. Measurement Interval (survey cycle). Record the number of growing seasons between the current and previous measurement or update.

7. Measurement System. Indicate whether English or metric system units are used.

8. Number of Measurements. Record the number of times the plot has been measured, using compatible methods, including establishment.

9. Sample Point Number. Record where applicable. Multiple data points at the sample location, or within the cluster/transect must be identified.

10. Site Index Reference. Consult FSH 2409.14 for definitions and standards. If none is available, record the author and year of publication of the reference document used in determining the site index.

11. Site Index (Plant) Species. Record appropriate Plant Species. Consult FSH 2409.14 for definitions and standards.

12. Stand Age. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

13. Stand Origin. Use definition and standards given in the Interim Resource Inventory Glossary.

22.2 - Land and Land Status Variables

Observe and record the following to describe the legal and administrative status of the plot location. If access to these variables leads to possible disclosure problems, then status information may be masked or collapsed in order to protect the continued ability to remeasure the plot location.

1. Administrative Unit. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

2. Ownership Class. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

3. Region/Station/Area. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

4. State/Territory. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

22.3 - Physiographic Variables

Measure and record the following information about the plot or plot vicinity:

1. Aspect (Exposure). Consult FSH 2409.14 for definitions and standards. If none available, record the compass azimuth in the direction of slope downhill. Record north as 360 degrees, record 999 for flat terrain. Do not use zero.

2. Slope Percent. Consult FSH 2409.14 for definitions and standards. If none available, record the average percent slope of the terrain on which the sample location falls.

3. Elevation. Consult FSH 2409.14 for definitions and standards. If none available, record the elevation of the plot center in units above sea level, using either map contours references or field calibrated equipment such as altimeters or global positioning systems.

4. Site Index. Consult FSH 2409.14 for definitions and standards. If none available, use definition and standards given in the Interim Resource Inventory Glossary.

22.4 - Vegetation Variables

Measure and record the following information on sample trees measured for growth and yield estimates:

1. Diameter at Breast Height (DBH) or Basal Diameter. Consult FSH 2409.14 for definitions and standards.

2. Crown Ratio or Height to Crown, Compacted. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

3. Mistletoe Infection Rating. Use definition and standards given in the Interim Resource Inventory Glossary. Provide for Regions 1-6, 10, and the Intermountain, Rocky Mountain, and Pacific Northwest Stations for those areas and species where dwarf mistletoe is economically important.

4. Number of Stems. Consult FSH 2409.14 for definitions and standards. If none is available, count and record the number of stems emanating from the root collar of a tree for which basal diameter is recorded.

5. Plant Species. Consult FSH 2409.14 for definitions and standards.

6. Defect Type. Consult FSH 2409.14 definitions and standards. Record the defect type for the principal defect. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

7. Sample Tree Count Factor. Record the number of trees represented by the sample tree on the same plot location. The number of trees represented is a tally of trees of the same description. Record when applicable.

8. Tree Number. Consult FSH 2409.14 for definitions and standards. If none is available, record a unique identification number assigned to a tree. The number should be unique within a plot.

9. Tree History. Use definition and standards given in the Interim Resource Inventory Glossary.

10. Tree Length (Height). Consult FSH 2409.14 for definitions and standards.

22.5 - Resource and Land Use Variables

Observe and record the following:

1. Stand History (most recent disturbance). Use definition and standards given in the Interim Resource Inventory Glossary. Record most recent, second most recent, and third most recent disturbance where applicable along with the estimated year the disturbances took place.

2. Time Since Disturbance(s) including time since most recent disturbance, time since second most recent disturbance, and time since third most recent disturbance. Use definition and standards given in the Interim Resource Inventory Glossary.

23 - Other Standard Information

When the information listed in sections 23.1-23.5 is needed to provide further descriptions of the permanent plots and sample trees, it must be standardized in order to be readily recognized and used by other units. Local needs and conditions may make additional nonstandard variables desirable. Define such elements locally.

23.1 - Control Variables

1. Inventory Source. Record the source of the data on record. Sources may include the original plot data, data updated by accounting or projection, and data taken from secondary sources such as publications and reports.

2. Sample Tree Azimuth (or bearing). Where applicable, measure and record the azimuth or bearing from the plot center or base line to the center of each sampled tree.

3. Sample Tree Distance. Where applicable, measure and record the horizontal distance from the plot center or base line to the center of each sampled tree. For trees taller that 4.5 feet, measure to the center of the tree at breast height.

4. Stand Area. Record the area of the stand in which the sampled variables are applicable.

5. Yield Study Reference. Record as a minimum, the author and year of publication of the reference document used in determining site productivity class.

23.2 - Ecology Variables

1. Ecosystem/Cover Type. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

2. Ecological Type (Habitat Type). Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

3. Ecological Unit. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

4. Site Productivity Class. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

5. Stand Structure. Use definition and standards given in the Interim Resource Inventory Glossary.

23.3 - Physiographic Variables

Identify and record the geomorphic landform. Consult the FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

23.4 - Vegetation Variables

Measure and record for sampled trees.

1. Crown Class. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

2. Crown Foliage Density. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

3. Crown Length (Depth). The difference between truncated height and height to crown. Consult FSH 2409.14 for definitions and standards, or use definition and standards given in the Interim Resource Inventory Glossary.

4. Distance to Seed Wall. Measure and record the distance from the sample plot to the closest seed wall. The seed wall is the boundary of an adjoining stand where there are seed-producing trees. Residual trees remaining in the stand after the regeneration cut are not a seed wall even though they may provide a seed source. Record only for stands or plots which have received a regeneration cutting within the past 20 years.

5. Height Growth. Consult FSH 2409.14 for definitions and standards.

6. Most Hazardous Pest. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary. Record if present.

7. Radial Growth (Increment). Consult FSH 2409.14 for definitions and standards.

8. Stump Diameter. Record DIB or DOB at top of stump. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary. Record for those trees that were cut within a specified number of years of the initial measurement.

9. Stump Height. Height of measurement to the top of the stump. Consult FSH 2409.14 for definitions and standards. Measure and record the vertical distance from the ground to the top of the stump on cut trees, measured on the uphill side to the point of the lowest level of the cut. For uncut trees, measure the vertical distance from the ground on the uphill side to a point set by study objectives or local utilization practices.

10. Tree Age. Consult FSH 2409.14 for definitions and standards.

11. Tree Class. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

12. Tree Position. Record the relative crown position of sampled live trees to the crowns of the surrounding live trees as either relict (a live tree standing well above the main canopy), overstory (trees whose total height is within 70 percent of the average of total height of the tallest trees in the stand as observed from each sample location), or as an understory tree (trees shorter than 70 percent using the above criteria).

13. Truncated Height. Height of measurement to top of live crown. Consult FSH 2409.14 for definitions and standards. If none available, record the vertical distance from the ground to the upper limit of the sampled tree's live stem. This will be the point of breakage if break occurred in the live crown. Otherwise, it is the vertical distance to the bottom of the dead top.

23.5 - Soil Related Variables

Measure and record the following:

1. Soil Taxonomic Unit. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.

2. Soil Map Unit. Consult FSH 2409.14 for definitions and standards. If none is available, use definition and standards given in the Interim Resource Inventory Glossary.