

**Forest Service Handbook
National Headquarters - Washington Office
Washington, DC**

**Forest Service Handbook 7109.13a – Geometronics Handbook
Chapter 10 - Map Standards**

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Responsible Staff:

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

13.5: Deletes reference to Wilderness Management Handbook 2309.19.

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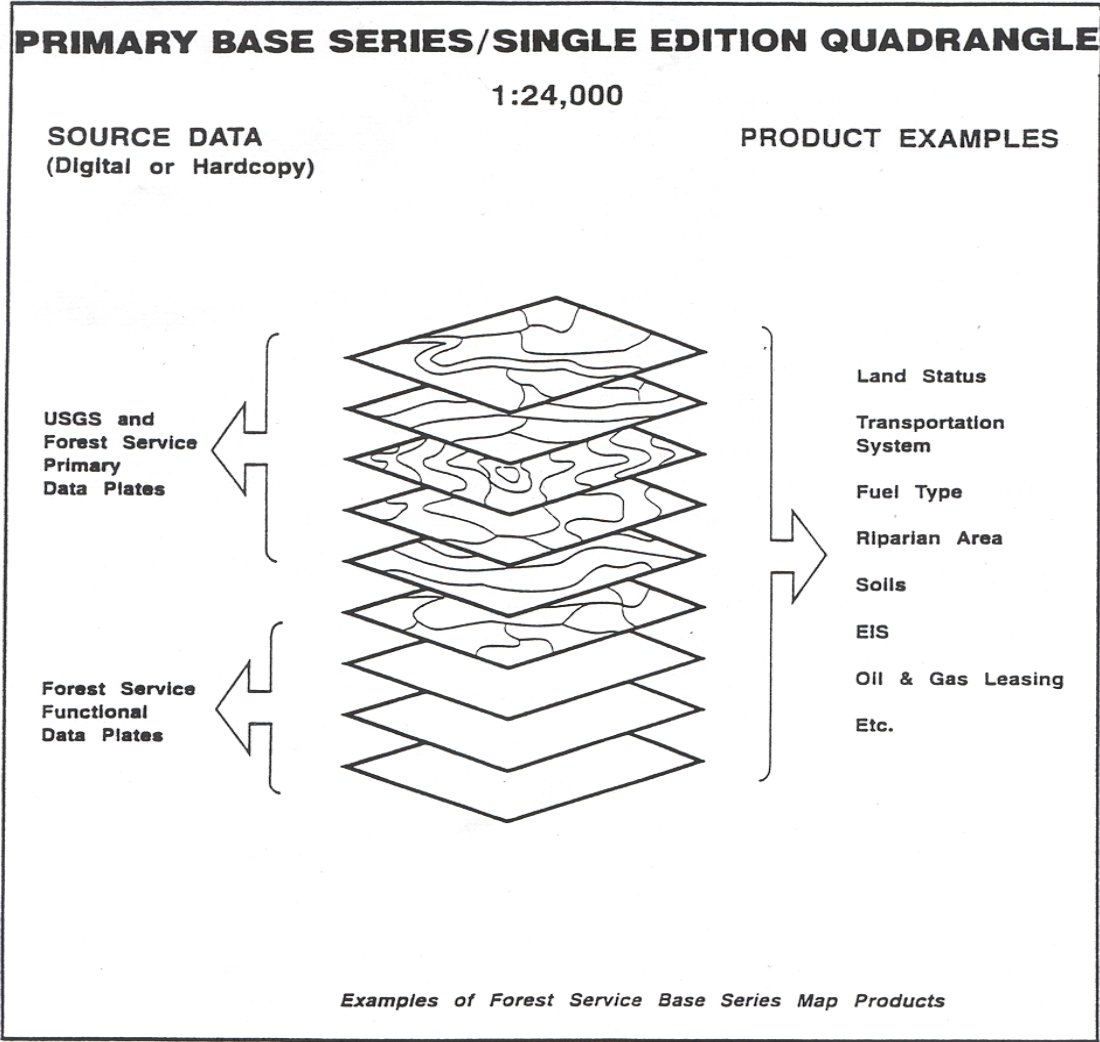
10.2 - Objective

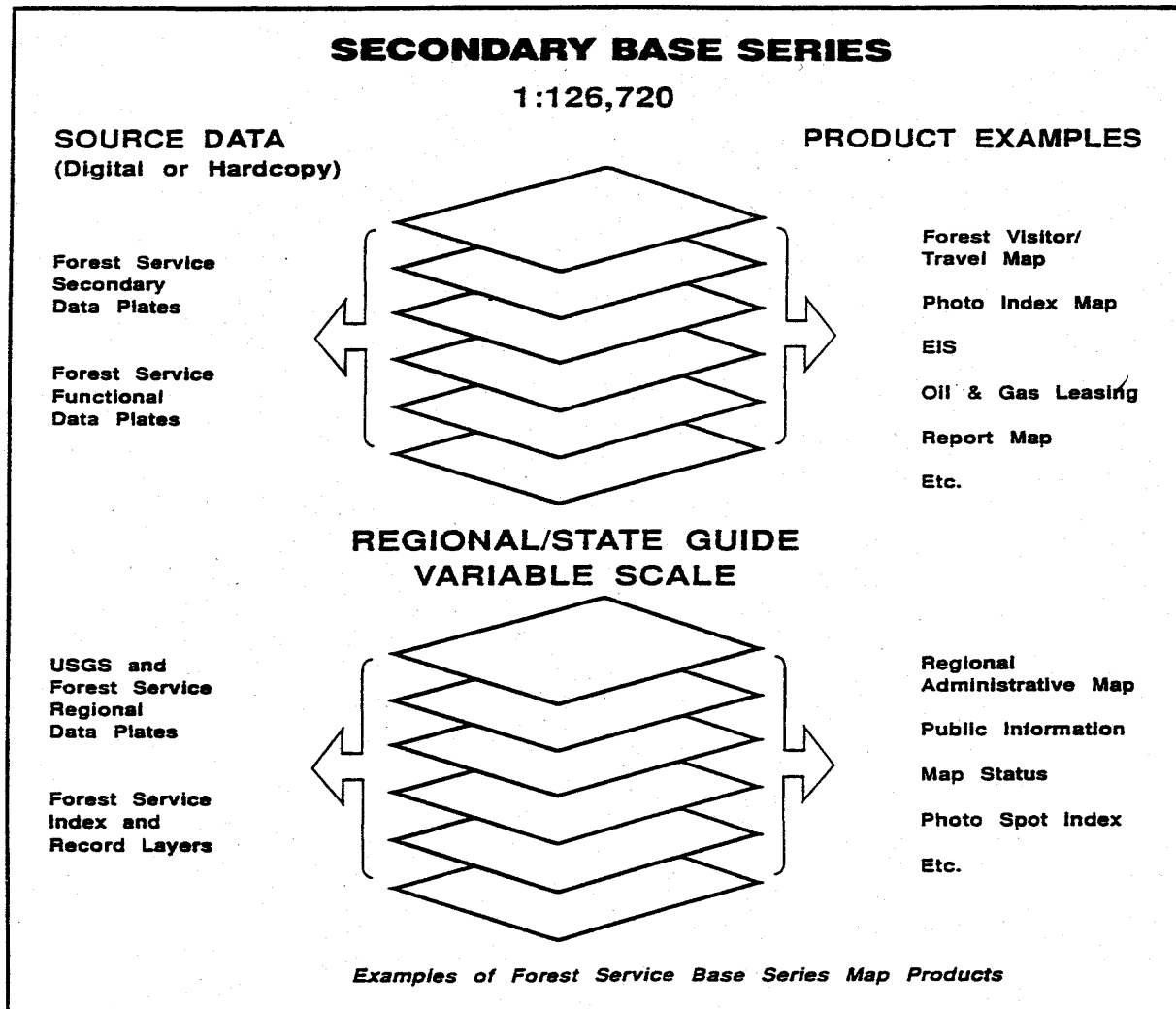
To achieve uniform Service-wide mapping formats and standards, the Forest Service has adopted a base series mapping system that makes use of the multilayer concept. This system includes a Primary Base Series/Single Edition Quadrangle (PBS/SEQ), a Secondary Base Series, and a Family of Maps - Visitor Information Series.

10.6 - Specifications for Base Series Mapping

The examples of Forest Service Base Series map products in exhibits 01 and 02, illustrate the multilayer concept and show in principle the functional layers that can be produced and co-registered with the 7.5-minute (or 15-minute in Alaska) base to form a variety of map composites. Exhibit 02 illustrates how the Secondary and Regional or State Guides are formed and shows some of the functional layers and products that can evolve from this system. Use this chapter in conjunction with "Cartographic Specifications and Symbols," EM-7140-24, (sec. 06.3) for all cartographic applications.

Specifications and standards for base layers have been designed to provide for a broad range of information requirements. Produce other layers, as needed, to provide additional information, but do not substitute for existing base data.





10.61- Deviations

Allow slight variations in line weights, type sizes, and styles in order to match existing map layers. Submit all requests for approval to deviate from specifications to the Washington Office Director of Engineering in writing. The Washington Office shall consider such requests on an individual basis and shall maintain a complete file of all proposed deviations. The Washington Office shall review the file during each revision cycle of FSM 7140, FSH 7109.13a, and "Cartographic Specifications and Symbols," EM-7140-24 (sec. 06.3). Requesting units shall bear additional map production costs resulting from approved variances. The Washington Office shall coordinate requests with other concerned units (FSM 7142.04a).

10.7 - Symbolization and Type Specifications

10.71 - Symbolization

See "Cartographic Specifications and Symbols," EM-7140-24 (sec. 06.3), for the map features displayed on the Primary and Secondary Base Series layers. The symbols are based on the U.S. Geological Survey Symbols for Standard Topographic Maps and on the National Recreation Symbols. In general, the same symbols are used for like features on both the Primary and Secondary Base Series unless exceptions are noted.

All symbols have been categorized by number and name of feature for standardization and to facilitate digital cartographic applications.

Map features displayed on Family of Maps series are also contained in "Cartographic Specifications and Symbols," EM-7140-24 (sec. 06.3).

10.72 - Type Specifications

Base series layers are standard in style and size of lettering as shown in "Cartographic Specifications and Symbols," EM-7140-24 (sec. 06.3).

11 - Primary Base Series/Single Edition Quadrangle

Each Region shall prepare a diagram and a quadrangle names list of the area of interest (sec. 05) for each National Forest or administrative unit and identify duplication of quads between Districts, Forests, or Regions (FSM 7142.04c).

11.1 - Format, Source, Scale, and Accuracy

11.11 - Format and Base Source

The format and base source for the Primary Base Series/Single Edition Quadrangle is based on the standard U.S. Geological Survey (USGS) 7.5-minute quadrangle for the United States, Alaska excepted, and the USGS 15-minute quadrangle for the Alaska Series.

Use the standard credit note as shown in "Cartographic Specifications and Symbols," EM-7140-24, chapter 1, Style Sheet for Collar Format (sec. 06.3).

11.12 - Scale

See FSM 7142.1.

11.13 - Accuracy

All Forest Service Primary Base Series/Single Edition Quadrangle map materials shall comply with National Map Accuracy Standards (sec. 05).

11.2 - Content

The Primary Base Series/Single Edition Quadrangle is a multi-layer mapping system that includes the following layers:

1. Transportation features - existing.
2. Drainage features (includes glaciers).
3. Political and Administrative boundaries.
4. Public Land Survey System modified by the Forest Service to include Forest Service landline location information.
5. Forest Service and other land ownership.
6. Other cultural features.
7. Lettering/Type.
8. Status Fill.
9. Drainage Fill.
10. Swamp.
11. Inundation.
12. Fence.
13. Sand.
14. Moraine.
15. Forest Service Red Symbols - Route Markers and Termini.
16. Legend Master.

17. Contours.
18. Tailings Ponds.
19. Tailings.
20. Intricate Surface.
21. National Recreation Trails.
22. Urban Tint.
23. Rice Field.
24. Mangrove.
25. Vegetation.
26. Orthophoto (optional).

Consider variations when obtaining primary data layers from the U.S. Geological Survey (USGS). In the interest of economy, the USGS may have combined separate layers into one composite; for example, lettering and boundaries.

11.21 - Boundaries

Establish boundary precedence by the order listed in “Cartographic Specifications and Symbols,” EM-7140-24, chapter 1 (sec. 06.3).

11.3 - Supplementary Base Reference Data

Obtain base reference overlays and materials from various sources as needed for project planning. Some available materials and sources include:

1. Control manuscripts; U.S. Geological Survey (USGS).
2. Control listings; USGS.
3. Control film positives; USGS.
4. Section corner control; Forest Service (FS), USGS, Bureau of Land Management (BLM).
5. Land net plates; USGS, BLM, FS.
6. Small-scale aerial photography; procured by the Forest Service or obtained from other agencies.

11.4 - Maintenance

Cyclic maintenance is mandatory. In areas where changes are extensive and frequent, the cycle should not exceed 7 years. In other areas, such as wilderness, the cycle may reach 10 years or more. Regions shall develop revision cycles tailored to expected levels of development (FSM 7142.04c). See section 14 of this chapter for map revision procedures.

Coordinate correction guide preparation for each quadrangle with all affected Forests and Regions to ensure that information is complete and to avoid redundant or incompatible versions (FSM 7142.04c).

Maintenance of Primary Base Series/Single Edition Quadrangle maps is most efficient when done for an entire administrative unit. A minimum block size of 10 quadrangles is recommended, where possible, to optimize productivity.

11.5 - Functional Layers

1. Functional and other resource data overlays may include but are not limited to:
 - a. Habitat types - allows for preparation of range allotment analysis and wildlife habitat improvement maps.
 - b. Timber - for compartment, type, stand, and sales area maps.
 - c. Slope classes - may include aspect.
 - d. Soil.
 - e. Fuel types.
 - f. Fire facilities.
 - g. Recreation sites and facilities, including trails.
 - h. Tract boundaries - for status and road right-of-way maps.
 - i. Geology and soils - for engineering materials and land use planning.
 - j. Transportation systems - planned.
 - k. Land survey inventory.
 - l. Capability areas.
 - m. Aerial photo spot index.
 - n. Sign inventory.
 - o. Habitat boundaries for threatened and endangered species.

2. Prepare these layers to the scale and format of the Primary Base Series/Single Edition Quadrangle (PBS/SEQ) on pre-registered stable base film. In Alaska, prepare functional layers at a scale of 1:31,680 (2 inches = 1 mile) due to the difficulty of adequately portraying and labeling resource layer polygons at the 1:63,360 PBS/SEQ scale.

- a. Ensure proper registration to base map content and perpetuate the inherent horizontal accuracy of the base.
- b. Provide for standard data entry and maintenance for the resource database. Ultimately, individual layers for Geographic Information System or other applications should be digital.
- c. Provide options for composting various combinations of layers so that it is possible to analyze and display the interrelationships among several resources.

11.6 - Interim Editions

Primary Base Series/Single Edition Quadrangle source materials meeting National Map Accuracy Standards and current symbol and format specifications and standards are not currently available for all Forest Service areas. Maps that do not meet these standards may be used in lieu of the Base Series until standard materials become available (FSM 7142.11).

11.61 - Modifications

Limit modifications to interim edition quadrangles to those that are necessary to add or revise detail. Modifications for aesthetic purposes only are inappropriate. Modification methods must provide for compliance with National Map Accuracy Standards except as required to match interim edition features.

11.62 - Acceptable Interim Editions

Interim editions, at 1:24,000 scale, are generally derived from 1:31,680-, 1:48,000-, and 1:63,360 scale quadrangle maps, orthophoto quads, or similar sources. Construct additional base layers as required to satisfy final product needs. If base layers are separated manually, horizontal accuracy may not meet National Map Accuracy Standards. NOTE: Digital data derived from this source may introduce positional inaccuracies that will be difficult to correct in a GIS or other automated products. Include the following credit statement on every interim edition:

This is an interim map, which may not comply with National Map Accuracy Standards. This edition is intended to provide temporary coverage, pending completion of standard mapping, and was converted from:

Complete the preceding statement by using one of the following interim titles:

1. U.S. Geological Survey, 7.5-minute, 1:24,000 Compilation Manuscripts (Date). (Available only as a composite, not in separate layers.)

2. Forest Service, 7.5-minute Topographic, 1:31,680 Quadrangle Map (Date). (May include some or all of the layers listed under sec. 11.5.)
3. U.S. Geological Survey, 15-minute, 1:48,000 Compilation Manuscripts (Date). (May include some or all of the layers listed under sec. 11.5.)
4. U.S. Geological Survey, 15-minute, 1:62,500 Quadrangle Map (Date). (May not meet National Map Accuracy Standards and may include some or all layers listed under sec. 11.5.)
5. Forest Service, 7.5-minute, 1:24,000 Orthophotoquad (Date). (Orthophoto of a 7.5-minute quadrangle and may include additional layers.)
6. U.S. Geological Survey, 7.5-minute, 1:24,000 Provisional Edition. (Meets National Map Accuracy Standards but not to finished specifications nor adequately separated.)

The Washington Office Director of Engineering must approve alternative interim titles before publication (FSM 7142.04a).

11.7 - Indexing System

A Primary Base Series/Single Edition Quadrangle (PBS/SEQ) can be referred to by name, geographic location, or quad index number. Quadrangle names do not serve to uniquely identify the quads because there are a number of duplicated quad names in the PBS/SEQ set of maps. The following gives information on the quad indexing system used to uniquely identify quads:

In the 7-1/2 minute series of maps (the PBS/SEQ series), a quad covers an area geographically bounded by meridians of longitude and parallels of longitude spaced 7 minutes 30 seconds apart. One degree of longitude or latitude is divided into eight even segments. The intervals are: 0 minutes 0 seconds; 7 minutes 30 seconds; 15 minutes 0 seconds; 22 minutes 30 seconds; 30 minutes, 0 seconds; 37 minutes 30 seconds; 45 minutes 0 seconds; and 52 minutes 30 seconds.

The Quad Index Number is a nine-digit number that indicates a specific quad in the PBS/SEQ series of maps. Within the one-degree range, the minute values of the PBS/SEQ southeast corner latitude and longitude are unique: 0, 7, 15, 22, 30, 37, 45, and 52. The degrees and minutes of latitude and longitude are combined to form this quad index number. The second values of the latitude and longitude are not necessary to provide unique quad identification values. Once the quad index number is used to identify specific PBS/SEQ quads, the second's value can be recovered by inspection.

The format used for the quad index number is DDMMdddmm where "DD" is the latitude degrees, "MM" is the latitude minutes, "ddd" is the longitude degrees, and "mm" is the longitude minute's values.

Examples:

The Fish Lake PBS/SEQ Quad has a southeast corner latitude 38-30-00 and longitude 111-37-30. The Quad Index Number is 383011137.

The Wheelwright PBS/SEQ Quad has a southeast corner latitude 37-15-00 and longitude 82-37-30. Its Quad Index Number is 371508237. Notice that a zero (0) was used in the "hundreds of degrees" location of longitude (082).

12 - Secondary Base Series

Use current Primary Base Series/Single Edition Quadrangle maps as the main source when constructing or revising the Secondary Base Series. New construction must conform to Service-wide standard specifications in this chapter and to "Cartographic Specifications and Symbols," EM-7140-24, chapter 2. When reformatting Secondary Base Series, use new border and margin format. Revision drafting of older maps not being reconstructed must be consistent with original line weights and symbols ("Cartographic Specifications and Symbols," EM-7140-24 (sec. 06.3)).

12.1 - Format

Limit mapping to geographic features or grid lines as close as possible to, and outside of, the unit boundary, except as approved by the Regional Forester for essential access routes and special management areas. Generalizing important map data outside the unit boundary is permissible. When it is necessary to divide large areas, keep Ranger Districts intact, if practical. Gather and edit information for all parts of the mapping area (FSM 7142.04c). Use the expanded index map (refer to "Cartographic Specifications and Symbols," EM-7140-24, exhibit 51 (sec. 06.3) to illustrate access routes or other information outside the forest boundary. Display this information on the index map to minimize mapped area shown on the main map.

12.11 - Margin Information

Place outside map border.

12.11a - Scale Note

Show the scale as a representative fraction; for example, 1:126,720 combined with dual bar scale (miles and kilometers). See "Cartographic Specifications and Symbols," EM-7140-24, exhibit 51, for scale bar format.

12.11b - Map Legend

Make all legend symbols the same size and appearance as the symbols used in the map body. See "Cartographic Specifications and Symbols," EM-7140-24, exhibit 51 (sec. 06.3), for minimum content required on the map. If the Supervisor's Office is located outside the mapped area, note location under the legend. As an alternative, show the Supervisor's Office as part of the legend caption. Region 10 is exempt from this requirement, as its Secondary Base Series Maps are not converted directly to Forest Visitor Maps.

12.11c - Names of Governing Meridians in Public Land Survey States

Include in the margin notes all principal meridians with influence on a given map regardless of the relative predominance within the total map area.

12.12 - Map Notes

12.12a - Credit Note

Place the credit note inside the border in the lower left corner unless space considerations require its placement elsewhere. See "Cartographic Specifications and Symbols," EM-7140-24, exhibit 51, for a sample credit note (sec. 06.3).

12.12b - Datum Statement

Place the datum statement inside the border in the lower right corner of the map unless space limitations require its placement elsewhere.

12.12c - Longitude Statement

Place the longitude statement in the center of the map along the south edge just within the borderline.

12.13 - Border Format

See "Cartographic Specifications and Symbols," EM-7140-24, exhibit 51, for specifications (sec. 06.3).

12.14 - Road Destinations

Use an arrow to indicate the continuation of a road. Name the destinations and include mileage distance and metric equivalents of all-important roads immediately outside the neat line of the mapped area.

12.2 - Scale

The scale for the Secondary Base Series is 1:126,720. These maps may be produced at an alternate scale of 1:100,000 metric. (Region 10 maps are produced at 1:100,000-scale but are not metric.)

12.3 - Accuracy and Source

Use only the most current and accurate source. Normally, this is the Primary Base Series/Single Edition Quadrangle (PBS/SEQ) including acceptable interim editions within the Forest area. The U.S. Geological Survey 7.5-minute quadrangle maps or 1:100,000-scale maps should normally be used as sources outside the Forest area.

12.4 - Other Public Lands

Show other public lands outside the Forest boundaries where necessary for administrative uses and indicate these lands in the map legend. The Bureau of Land Management 1:100,000 maps are usually the prime source for this information. Place a map note as part of the map legend

information to indicate the source of information and the date of verification. Include the following statement:

Public lands are subject to changes and leasing; local inquiry should be made before entering.

12.5 - Content

The Secondary Base Series may include the following layers:

1. Black.
 - a. Culture.
 - b. Boundary.
 - c. Landline, surveyed, reliable.
 - d. Landline, surveyed, approximate.
 - e. Landline, protracted.
 - f. Land status outline.
 - g. Lettering/symbols.
 - h. Section number.
 - i. Road class 3-B dots.
 - j. Black pattern (dot/hachure/land surface).
 - k. Map border.
 - l. Ranger District boundary.
 - m. Ranger District name.
2. Blue.
 - a. Drainage.
 - b. Open-water.
 - c. Wild and scenic river pattern (pattern for intermittent lakes, swamp, and land-subject-to-inundation may be prepared on separate layers).
3. Red.

- a. 7.5-minute or 15-minute (Alaska) projection.
 - b. National Recreation Area or Scenic Trail.
 - c. Urban areas.
 - d. Lettering/symbols (including recreation information).
 - e. Road fill.
4. Green.
- a. Primary Forest or Grasslands.
 - b. Adjacent Forest and Grasslands.
 - c. Other Forest area.
5. Optional land areas to include on map. See "Cartographic Specifications and Symbols," EM-7140-24 for color tints.
- a. State.
 - b. Bureau of Land Management.
 - c. Indian Reservations.
 - d. Other Federal lands including National Parks.
 - e. Undesignated exterior area (yellow tint).
6. Optional available at extra cost.
- a. Contours/shaded relief.
 - b. Brown lettering/symbols/patterns.
 - c. Approximate location layer: roads, trails, and so forth. (Large quantities of non-photogrammetrically derived locations). These may require more than one layer.
 - d. Extra separation of items by classification; such as fourth-class roads, trails.
 - e. Universal Transverse Mercator ticks or grids.
 - f. Universal Transverse Mercator lettering.

12.6 - Maintenance

Maintain and edit the secondary base series on a cyclic basis. As with the Primary Base Series/Single Edition Quadrangle, Regions shall establish unit maintenance cycles consistent with the expected level of management intensity within the mapping area. Normal maintenance is between 4 and 10 years and should take place following maintenance of the Primary Base Series/Single Edition Quadrangle (FSM 7142.04c).

12.7 - Functional Layers

Prepare supplementary layers as needed to meet specific needs and to show public use information. Layers may include but are not limited to (FSM 7142.04c):

1. Special recreation information.
2. Alphanumeric site index to recreation facilities, and so forth.
3. Azimuth circle.
4. Travel management, including off-road uses.
5. Slope class or zone.
6. Contours.
7. Fire closure.
8. Geodetic control diagram.
9. Photo spot index.
10. Special study areas.
11. Orthophoto.
12. Large-scale mapping and photo indexes.
13. Habitat boundaries for threatened and endangered species.

13 - Family of Maps - Visitor Information Series

13.1 - A Guide to Your National Forests

13.11 - Format

Print the map in full color and fold to a 4" X 9" (10 cm X 23 cm) vertical format. Use the Family of Maps series cover design. See USDA Visual Management Manual AD-791, Volume 1, Graphic Design, (sec. 06.3) for cover specifications.

13.12 - Source and Scale

This map is derived from 1:7,500,000 USGS National Atlas of the United States of America, with the scale reduced and the map modified by the Forest Service.

13.13 - Content

13.13a - Mandatory Map Content

1. National Forests and Grasslands.
2. Forest Service Offices: Regional headquarters, Forest and Range Experiment Station headquarters, Forest Products Laboratory, Grey Towers National Historic Landmark, and State and Private Forestry Area headquarters.
3. Major cities, major drainages, the Interstate Highway System, and other important roads.
4. Forest Service Regional boundaries and State boundaries.
5. Shaded relief.

13.13b - Mandatory Narrative Content

1. "Welcome" message.
2. Description of National Forest System, Research, and State and Private Forestry.
3. Addresses and phone numbers of Washington Office, Regional Offices, Forests, Grasslands, Stations, and Areas.
4. Brief description of each Region including geographic location, and narrative describing the Region's favorable points.
5. Description of items shown on map.
6. Date map was printed.
7. Multiple values statement.
8. Required Office of the General Counsel (OGC) statements

Some examples may be disclaimers or non-discrimination statements. The following text is an example of an OGC statement:

Your Responsibility. The National Forests are public lands in joint ownership by all citizens; their management requires different laws and regulations based on local

conditions. Please become familiar with restrictions by checking with local offices and reading signs and bulletin boards.

It is your responsibility to be aware of the potential risks and take safety precautions at all times when you visit National Forest areas. Changing terrain, forest, and weather conditions present a wide variety of hazards. Hazards include, but are not limited to: snow and ice fields, landslides, falling trees or limbs, high or rushing water, contaminated water, wild animals, severe weather, becoming lost or over-exerted, hypothermia, and exposure to unreasonable acts of other people.

13.13c - Other Content

May include photographs showing a diversity of recreation activities, Forest visitors, and management activities.

13.14 - Symbolization, Type

As determined by the Manager, Geometronics Service Center (FSM 7142.04d).

13.15 - Maintenance

See FSM 7143.11.

13.2 - Regional or State Guide

13.21 - Format

Map scale may vary so the map will fold to 4" X 9" (10 cm X 23 cm) vertical with the Family of Maps Series cover design. See the USDA Visual Management Manual, AD-791, Volume 1, Graphic Design, (sec. 06.3) for cover specifications.

13.22 - Source and Scale

See FSM 7143.12.

13.23 - Content

13.23a - Mandatory Map Content

1. Interstate highway system, selected U.S. highways, and primary State highways.
2. State boundaries.
3. Major rivers and lakes.
4. Regional and Forest Supervisor offices.
5. National Forests, Grasslands, and special designation area names and boundaries.

6. Latitude and longitude tick every 2 degrees and labels.
7. Other Federal lands; National Parks and Monuments, Wildlife Refuges, Indian Reservations, and other agencies' National Recreation Areas.

13.23b - Optional Map Content

1. Major visitor centers open year-round.
2. Wilderness.
3. Ranger District offices.

13.23c - Mandatory Narrative Content

1. Format similar to "A Guide to Your National Forests."
2. "Welcome" message.
3. Multiple use or multiple value message.
4. Regional Office and Forest Supervisor Office addresses and phone numbers.
5. Narrative description of each Forest.
6. Date printed.
7. Other maps available and sources.
8. Barrier-free access information.
9. Required Office of the General Counsel statements. See section 13.13b, paragraph 8 for an example of such a statement.
10. Description of items shown on the map.
11. Special designation areas, such as National Recreation Areas, National Scenic Areas, and National Monuments.

13.23d - Optional Narrative Content

1. Ranger District addresses and phone numbers.
2. Addresses and phone numbers of adjacent Regions.
3. Addresses and phone numbers for Federal, State, and local agencies.
4. Emergency phone numbers.

5. Wilderness narrative.
6. Wild and Scenic Rivers.
7. Scenic Byways narrative.
8. Visitor centers.
9. Information describing the availability of brochures or other publications and how to get them.
10. Historical/archaeological areas.
11. National Scenic or Historic Trails.
12. Other content includes: Photographs showing a diversity of management and recreation activities such as skiing, hiking, boating. Include age, race, gender, and physical ability of forest visitors.

13.24 - Symbolization, Type

The Regional Foresters and Manager, Geometronics Service Center (GSC) develop symbol and type specifications (FSM 7142.04c and FSM 7142.04d).

13.25 - Maintenance

See FSM 7143.12.

13.3 - Pocket Visitor Guide

13.31 - Format

The guide is optional and will fold to 3" X 5 1/2" (8 cm X 14 cm) vertical format and will have the Family of Maps series cover design. See USDA Visual Management Manual, AD-791, Volume 1, Graphic Design (sec. 06.3) for cover specifications.

13.32 - Source and Scale

(See FSM 7143.13).

13.33 - Content

13.33a - Mandatory Map Content

The map should include:

1. Cities and towns.
2. Large city urban area boundary lines.

3. Primary, secondary, and other significant roads including those accessing Forest Service facilities or points of interest.
4. U.S., State, and county highway numbers.
5. Forest route numbers.
6. National Forest boundary lines.
7. State and county boundary lines.
8. State Forests, National Parks, Wild and Scenic Rivers, National Recreation Areas, Wildernesses, Indian Reservations, Bureau of Land Management lands, or other interest areas.
9. Supervisor Offices, District Ranger Stations, and Visitor Centers.
10. Recreation sites, Scenic Byways, points of interest, winter sports areas, and historical areas.
11. Larger lakes, principal streams, and their names.
12. Canoe routes.
13. Hiking trails with names and/or numbers.
14. Shelters.
15. Lands administered by the Forest Service.
16. Key map.
17. Title, scale bars, and legend.
18. Mileage and kilometers to popular destination points.
19. Wildlife viewing areas.
20. Barrier-free facilities and information.

13.33b - Mandatory Narrative Content

1. "Welcome" message.
2. Phone numbers and addresses for Forests and Districts.
3. A matrix of recreational facilities and activities.
4. Barrier-free facilities.

5. Visitor centers.
6. Scenic Byways.
7. Wildernesses.
8. Date printed.
9. Required Office of the General Counsel statements.
10. Wild and Scenic Rivers.
11. National Recreation Areas.
12. National Scenic or Historic Trails.

13.33c - Optional Map Content

1. Regional Office phone number and address.
2. Overview of area.
3. Points of interest.
4. Tread Lightly ethic.
5. Leave No Trace ethic.
6. Fire prevention information.
7. Cooperating association discussion and locations of sales outlets.
8. Volunteer opportunities available.
9. Information about the availability of maps, brochures, and other publications and how to get them.

13.33d - Other Content

Include photographs showing a diversity of recreation activities, a diverse population of forest visitors, and various management activities.

13.34 - Symbolization, Type

The Regional Foresters and Manager, Geometronics Service Center (GSC) develop symbol and type specifications (FSM 7142.04c and FSM 7142.04d).

13.4 - Forest Visitor Maps

These maps are a derivative of the Secondary Base Series (SBS). Delete or de-emphasize SBS information that is not needed nor helpful to visitors (FSM 7143.14). See exhibit 01 for examples of statements on interpreting travel management rules.

13.4 - Exhibit 01

INTERPRETING TRAVEL MANAGEMENT RULES

Example:

INTERPRETING TRAVEL MANAGEMENT RULES

The following steps should be used to properly interpret Travel Management Rules:

1. Are you on XYZ National Forest land? This map shows travel management for XYZ National Forest land only. See maps of other Forests for their travel management rules. Other land management agencies may also issue travel management information for their lands.
2. Is the area open, restricted, or closed? Three types of travel management areas are portrayed on this map. Open areas are available for motorized vehicle use on and off of roads as long as no damage is done to the land (see the TREAD LIGHTLY message). Restricted areas may be open or closed to various vehicle types during different seasons. Closed areas are closed year round to motorized vehicles.
3. If you are in a restricted area, consult the Area Table. Each restricted area has a letter code cross-referenced to the table. (See "Cartographic Specifications and Symbols," EM-7140-24, ex. 17, No. 291) (sec. 06.3).
4. Within restricted areas, most roads shown on this map are open to motorized vehicles operated in accordance with State law. Roads open in a restricted area (see "Cartographic Specifications and Symbols," EM-7140-24, ex. 47, No. 750, ex. 50, No. 17,) (sec. 06.3) are highlighted by a continuous green overprint. However, roads highlighted by continuous orange overprint on this map are subject to Area Table rules, as are most trails, all unmapped roads, and the land itself. (See "Cartographic Specifications and Symbols," EM-7140-24, ex. 47, No. 751, ex. 50, No. 19) (sec. 06.3).
5. If you are on a road or trail highlighted by a dashed orange overprint symbol on this map (see "Cartographic Specifications and Symbols," EM-7140-24, ex. 47, No. 753, ex. 50, No. 19,) (sec. 06.3), consult the Road and Trail Table. Each route has a number code cross-referenced to the table (see "Cartographic Specifications and Symbols," EM-7140-24, ex. 17, no. 292) (sec. 06.3).
6. Please respect private property. Many routes across private land (white on this map) are not available for public use. However, public access is permitted on routes shown by continuous green overprint (see "Cartographic Specifications and Symbols," EM-7140-24, ex. 50, no. 18 for color) (sec. 06.3).
7. While not a travel management area, Wilderness is always closed year round to motorized vehicles as well as mechanized equipment, including bicycles.

13.41 - Format

The map will fold to 4" X 9" (10 cm X 23 cm) with a vertical format and use the Family of Maps cover design. See USDA Visual Management Manual, AD-791, Volume 1, Graphic Design (sec. 06.3) for cover specifications.

13.42 - Map Title

Use the map cover panels as the map title. The title must consist of the names of National Forests or other unit names followed by subordinate designations as required. The title for the map of a National Forest, National Grassland, Land Utilization Project, or Purchase Unit must conform to the proper choice of the following alternatives:

1. When a map is to cover an entire unit, use the official title of the unit; for example, "White Yadkin Purchase Unit." Include in the body of the map, the name of any portion of a contiguous unit shown on the map. Do not include in the official title.
2. A map published for a given unit may cover another unit in its entirety. For example, the "White River National Forest" map may also include "the Dillon Ranger District of the Arapaho National Forest" in its entirety. Include the name of the satellite unit within the body of the map and parenthetically in smaller type in the title.
3. Give equal recognition to a National Grassland and a National Forest when one map shows both in their entirety even though both are administered from the same headquarters. Show the names of each unit in the same size and style of type in the title.
4. A National Forest or National Grassland may cover an area too large for a single map sheet. In these cases, title each sheet with the official map name. Use a second line in smaller type to show the name of the portion portrayed.
5. If it is not practicable to divide an area into general portions, such as the east and west or north and south, divide a Forest by Ranger Districts or other administrative units. Show the name of the portion portrayed in a subordinate type size on a second line.

13.43 - Scale

The scale is normally the same as the Secondary Base Series--1:126,720 or, metric, 1:100,000. The map scale may be reduced to a minimum scale of 1:253,440 for Regions 1 through 9 or enlarged to not more than 1" to 1 mile when appropriate. Region 10 maps may be produced at a smaller scale such as 1:506,880 (1" to 8 miles).

13.44 - Accuracy

Any map information or overlays added must conform to the same accuracy standards as the Secondary Base Series.

13.45 - Content

13.45a - Mandatory Map Content

1. Interstate, U.S., primary and secondary State highways, and Forest roads.
2. State, county, and Forest boundaries.
3. Perennial rivers, streams, lakes, and selected intermittent streams.
4. District offices, information and visitor centers.
5. Wilderness and Primitive Area names and boundaries.
6. Forest Service recreation sites and developments, campgrounds, picnic areas, trailheads, boating areas, or other major recreation developments as determined by Regional and Forest recreation staffs.
7. All National Recreation Area boundaries and office locations.
8. Foot, horse, national, and all-terrain vehicle/off-highway vehicle routes.
9. National Parks and Monuments, Wildlife Refuges, and Indian Reservations.
10. Scenic Byways.
11. National Grasslands.
12. Wild and Scenic Rivers.
13. Special areas, such as all-terrain vehicle/off-highway vehicle areas and points of interest.
14. Federal, State, and private land ownership.
15. Travel management information that shows the long-term (3 to 4 years) area, route, and use restrictions. See "Cartographic Specifications and Symbols," EM-7140-24, chapter 2 (sec. 06.3).

13.45b - Optional Map Content

1. Section lines and numbers.
2. Contour lines.
3. Hunting and fishing information.
4. High use areas.
5. Special management areas.
6. Other major recreation sites including non-Forest Service sites.

7. Mileage and kilometers between popular destination points.

13.45c - Mandatory Narrative Content

1. "Welcome" message.
2. Forest Supervisor's Office, District Office, Visitor Center, or Information Center addresses and phone numbers.
3. Points of interest.
4. How to use this map.
5. Vicinity map.
6. Recreation facility matrix.
7. Camping reservation information.
8. Leave No Trace ethic.
9. Tread Lightly ethic.
10. Barrier free access.
11. Safety message.
12. Multiple use messages.
13. Non-discrimination message.
14. Fire prevention message.
15. A reference to the Code of Federal Regulations that authorize travel restrictions and the penalties or fines involved. Do not place Forest Supervisor's Orders on the maps, but the location where those orders can be viewed may be listed.
16. Include Office of General Counsel (OGC) required statements. See section 13.13b, paragraph 8 for an example of such a statement.
17. Statement on Drinking Water. Include the following statement on forest visitor maps:

All surface water, though it appears clear and cool, should be boiled for at least five minutes prior to drinking or using for food preparation.
18. An explanation of travel information and travel management terms that are used on the map. The following are examples of peripheral text on Forest Visitor/Travel Management maps. The examples are for guidance only. The Forest should determine the exact wording. Substitute "Grassland" for "Forest" where appropriate.

a. Title: "TRAVEL ON THE XYZ NATIONAL FOREST" or "TRAVEL ON THE FOREST."

b. Introduction. Explain why travel management is implemented; that is, promotion of safe travel while protecting resources. Encourage familiarity with rules and contact with Forest Service personnel for additional explanation and answers to questions.

Example: The XYZ National Forest has established motor vehicle travel controls in order to enable safe motorized travel while also protecting natural resources and minimizing conflict with non-motorized uses. Please familiarize yourself with the rules noted herein and posted at Forest Service offices and on the ground. If you have questions, ask us! By understanding and observing travel regulations, you will have a more enjoyable visit to your public lands.

c. Scope and limitations of map. Map shows only long-term, general rules; Forest Supervisor may issue orders that differ with map and how these orders are disseminated internally and externally.

Example: The only rules shown on this map are those that are general in nature and that apply broadly throughout the XYZ National Forest. The Forest Supervisor may issue rules that supplement or differ from those in this publication. Modifications will be posted in the Forest Supervisor's Office, Ranger District Offices, and at the affected sites. See the back cover for a list of offices.

d. Other travel management information.

Example: You should also see maps of other National Forests for their travel management rules. Other land management agencies may also issue travel management information for their lands.

e. Route types. Explain the variety of roads and trails that occur within the Forest and how the map indicates vehicle suitability.

Example: A network of numbered roads and trails will take you within the XYZ National Forest. They range from narrow foot trails and unimproved, dirt, 4-wheel-drive roads to well-maintained, paved roads. The map legend defines the symbols that indicate construction and surface type. Vehicle suitability is also influenced by road maintenance, especially on unpaved roads. Forest road number signs with horizontal numbers indicate roads generally maintained for sedans; signs with numbers stacked vertically are used on roads not maintained for passenger cars. Remember that Forest roads can present hazards not usually encountered on well-traveled state highways.

f. Travel restrictions explanation. This section explains travel restrictions and explains the use of a specific Forest's travel management program. Mapped area boundaries should correlate with travel management area boundaries on the ground ("Cartographic Specifications and Symbols," EM-7140-24, exhibit 21, symbol 343) (sec. 06.3). Use diagrams and/or symbols as necessary to clearly show requirements for restricted travel areas.

Example: Travel management rules have been established for a variety of reasons. Areas adjacent to roads may be susceptible to environmental damage from uncontrolled vehicle use. Travel restrictions during spring thawing or elk calving may be lifted during summer. Until it dries out, a soggy road may be closed to prevent erosion and damage to the roadway. Points of predictable seasonal closure are indicated with symbol: ("Cartographic Specification and Symbols," EM-7140-24, exhibit 17, no. 290) (sec. 06.3). Check with Forest Service offices for actual closure locations. Wilderness areas are permanently closed to motorized vehicles and mechanized equipment, including bicycles. Wilderness entry may also be controlled to reduce impact on campsites and preserve opportunities for solitude.

g. Tread Lightly. The Tread Lightly pledge and logo shall be included in the text of the map. Additional explanation of the Tread Lightly program is optional.

Example: (TREAD LIGHTLY LOGO at top)

I PLEDGE TO TREAD LIGHTLY BY --

T raveling only where motorized vehicles are permitted.

R especting the rights of hikers, skiers, campers, and others to enjoy their activities undisturbed.

E ducating myself by obtaining travel information and regulations from public agencies, complying with signs and barriers, and asking owner's permission to cross private property.

A voiding streams, lakeshores, meadows, muddy roads, steep hillsides, wildlife, and livestock.

D riving responsibly to protect the environment and preserve opportunities to enjoy my vehicle on wild lands.

h. Explanation of travel management symbology. See exhibit 03 for further information on step-by-step instructions on interpretation of travel management map portrayal, tables, and legend definitions.

13.45d - Optional Narrative Content

1. Pictures relating to the text. Include photographs showing a diverse range of recreation activities, a diverse population of forest visitors, and a variety of management activities.

2. Smokey/Woodsy message.

3. Wilderness.

4. Scenic Byways.

5. Other Congressionally designated areas or trails that you have on your Forest or Grassland.
6. U.S. Geological Survey quad and/or Primary Base/Single Edition index.
7. Volunteers and/or employment opportunities.
8. Cultural and/or historic resources.
9. Fire prevention information.
10. Partnerships and public involvement.
11. Permitted resorts or cabins.
12. History of the Forest or Grassland.
13. Special interest areas.
14. Information about other maps, brochures, or publications available and where to get them.
15. Other agency contacts.
16. Hunting and fishing information.

13.45e - Other Optional Content

Water travel restrictions may be too numerous to show on a Forest Visitor Map. A statement may be added advising visitors where they can get this travel information.

13.46 - Maintenance

Keep up-to-date all layers generated in Regional geomatics organizations.

13.5 - Wilderness and Special Area Maps

The Forest Service provides maps of special areas--such as Wildernesses; National Scenic Trails; Wild and Scenic Rivers; Geologic, Scenic, and National Recreation Areas; and other areas to meet special public and management needs. Use standard formats, symbology, and colors established for the Primary and Secondary Base Series and modify sizes and scales to fit specific uses (FSM 7143.15).

13.51 - Format, Scale, and Size

1. Format. Normally, conform to the format used for Primary Base Series/Single Edition Quadrangle maps, but other geographic lines or topographic or cultural features may be

followed. Include enough contiguous area to show essential access routes and management areas.

2. Scale. Because of the wide variety of needs and interests found within special areas, there is no specific standard scale for this series or type of map. Consider the size when determining scale for a particular special area map.

3. Size. To accommodate field use of the unfolded map and to keep printing costs down, keep the size reasonable. If folded, 4" X 9" (10 cm X 23 cm) and 3" X 5 1/2" (8 cm X 14 cm) are the recommended sizes to conform to the Family of Maps fold sizes. Use multiple map sheets when necessary to accommodate larger areas.

13.52 - Content

Special area maps should be any combination of the various layers that comprise the appropriate base series plus necessary functional layers. For example, a Wilderness map might include:

1. Entry points and parking areas.
2. Trails.
3. Springs, streams, rivers, and lakes.
4. National Forest land ownership.
5. Contour lines.
6. Location of communications for emergency use.
7. Use restrictions.

13.53 - Symbolization

Match special symbols used on the map to symbols used on signs on the ground. Use approved symbols such as the Federal Recreation Symbols and others in "Cartographic Specifications and Symbols," EM-7140-24.

13.54 - Maintenance

(See FSM 7143.12).

14 - Map Revision Procedures

Follow these guidelines when submitting correction guide materials to the Geometronics Service Center for revision work.

14.04 - Responsibility

The Regional Foresters and Manager, Geometronics Service Center should document map revision materials and record work submitted and work completed. Coordinate all work to avoid delays and to ensure production of the needed materials.

14.04a - Regional Foresters

It is the responsibility of the Regional Foresters to:

1. Ensure revision of maps in their area of interest, as defined in section 05.
2. Plan an annual mapping program, which includes:
 - a. Identify an annual mapping program of work, scheduled in cooperation with Geometronics Service Center. Include in the schedule the Primary Base/Single Edition Quadrangles, Cartographic Feature File (CFF), Digital Elevation Models (DEM), and the Secondary Base sheets to be updated and orthophotos to be produced, submission dates for correction packages, and desired project completion dates.
 - b. Ensure availability of all materials, other than U.S. Geological Survey separation layers, necessary to perform required maintenance.
 - c. Edit the correction package submitted to ensure that all information is complete, correct, and relevant.
 - d. Coordinate with adjacent Regions and between adjacent Forests to avoid conflicts in the maintenance program for common quadrangles.
 - e. Ensure receipt of correction packages by the date agreed upon.

14.04b - Manager, Geometronics Service Center

It is the responsibility of the Manager, Geometronics Service Center (GSC) to oversee cartographic work performed from the correction guides. This work includes the following:

1. Completing of all cartographic functions, including photo transfer, digitizing, drafting, compilation, and photographic reproduction.
2. Inspecting of finished materials to ensure conformance to standards set forth in this Handbook and in "Cartographic Specifications and Symbols," EM-7140-24 (sec. 06.3).
3. Ensuring products are completed and delivered by the date agreed upon with customers.

15 - Correction Guide and Instructions

See "Correction Guide Instructions, Map Revision Procedures," EM-7140-10, for the preparation of correction guides for Primary and Secondary Base Series maps (sec. 06.3).

15.04 - Responsibility

15.04a - Regional Geometronics Leader

It is the responsibility of the Regional Geometronics Leader to ensure that map atlases are revised and updated on a regular basis.

15.04b - Forest Geometronics Coordinators

It is the responsibility of the Forest Geometronics Coordinators to maintain the base series correction atlas.

15.1 - Correction Guide Package Submission and Contents

The correction guide package is defined in sec. 05 of this Handbook.

The package consists of any combination of the following: paper print, stable-base map composite, narrative descriptions, and copies of the latest status atlas, orthophotos, and aerial photos. If performing photo transfer work, submit the work on a stable base material and note the transfer device. If possible, the correction guide should be at a scale of 1:24,000, except in Alaska, where a scale of 1:63,360 is preferred. The Secondary Base Series correction guides are 1:126,720 (1/2 inch to 1 mile) or at an alternative scale of 1:100,000 in Alaska.

Discontinue corrections as of the submission date that the correction package is sent to the Geometronics Service Center. As a general rule, make no corrections after the submission date. If a change is thought to be unavoidable (large land exchange) or the Forest Supervisor deems the change essential for proper administration of the area to be mapped, ask GSC to reschedule the project. Clarify and document specific project needs, such as, the pattern for screened Forest or non-National Forest System lands, other screening needs not covered by previous specifications, and areas where protraction are not available and the initiation of Forest Service protraction by GSC is requested.

15.2 - Preparation of Correction Guide Package

Use these atlases to prepare and assemble the material for the correction guide package submitted to the Geometronics Service Center. The atlas facilitates the gathering of materials and provides the most recent information. Replace atlas sheets with new materials when received from GSC.