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FSM 2500 – WATERSHED AND AIR MANAGEMENT

CHAPTER 2550 – SOIL MANAGEMENT

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Posting Instructions: Amendments are numbered consecutively by title and calendar year. Post by document; remove the entire document and replace it with this amendment. Retain this transmittal as the first page(s) of this document. The last amendment to this title was 2500-2009-1 to 2550.

New Document	2550	20 Pages
Superseded Document(s) by Issuance Number and Effective Date	2550 (Amendment 2500-2009-1, 02/12/2009)	9 Pages

Digest:

2550 – Makes numerous updates throughout and incorporates direction previously contained in FSH 2509.18. FSH 2509.18 is removed from the directive system.

Table of Contents

2550.1 - Authority

The authorities governing Forest Service soil management are:

1. The Organic Administration Act of 1897 (16 U.S.C. 473-475). Authorizes the Secretary of Agriculture to establish regulations to govern the occupancy and use of National Forests and "…to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of citizens of the United States."

2. Bankhead-Jones Act of 1937. The Secretary is authorized and directed to develop a program of land conservation and land utilization, in order thereby to correct maladjustments in land use, and thus assist in controlling soil erosion (reforestation), preserving natural resources, (protecting fish and wildlife, developing and protecting recreational facilities), mitigating floods, (preventing impairment of dams and reservoirs, developing energy resources), conserving surface and subsurface moisture, protecting the watersheds of navigable streams, and protecting the public lands, health, safety, and welfare.

3. The Multiple-Use, Sustained-Yield Act of 1960 (P.L. 86-517, 74 Stat. 215; 16 U.S.C. 528-531). States that the National Forests are to be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. This Act directs the Secretary to manage these resources in the combination that will best meet the needs of the American people; providing for periodic adjustments in use to conform to changing needs and conditions; and harmonious and coordinated management of the resources without impairment of the productivity of the land. Sustained yield means achieving and maintaining into perpetuity a high-level annual or regular periodic output of renewable resources without impairment of the productivity of the land.

4. The National Environmental Policy Act (NEPA) of 1969 (16 U.S.C. 4321). Declares it is the policy of the Federal Government to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans. The Act requires agencies to analyze the physical, social, and economic effects associated with proposed plans and decisions, to consider alternatives to the action proposed, and to document the results of the analysis.

5. The Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (16 U.S.C. 1600-1614) (as amended by National Forest Management Act (NFMA) of 1976 (16 U.S.C. 472a). States that the development and administration of the renewable resources of the National Forest System are to be in full accord with the concepts for multiple use and sustained yield of products and services as set forth in the Multiple-Use Sustained Yield Act of 1960. The Act requires the maintenance of productivity of the

land and the protection and, where appropriate, improvement of the quality of the soil and water resources. The Act specifies that substantial and permanent impairment of productivity must be avoided and has far-reaching implications for watershed management in the National Forest System. This Act as amended contains the following sections and provisions pertinent to maintaining a sound soil management program:

a. Section 3 paragraph 6b. This section directs the Secretary of Agriculture to make, and keep current, a comprehensive survey and analysis of conditions of, and requirements for, forest and rangelands of the United States, including a determination of the present and potential productivity of the land.

b. Section 5. This section directs the Secretary of Agriculture to develop and maintain on a continuing basis, a comprehensive and appropriately detailed inventory of all National Forest System lands and renewable resources.

c. Section 6 paragraph k. This section directs the Secretary of Agriculture to identify lands within the management area which are not suited for timber production.

2550.2 - Objective

Maintain or restore soil quality on National Forest System lands.

Manage resource uses and soil resources on National Forest System lands to sustain ecological processes and function so that desired ecosystem services are provided in perpetuity.

2550.3 - Policy

Responsible soil stewardship promotes and sustains biological and hydrologic function on National Forest System lands. Soils are essential for storing carbon, nutrients, soil biota, and water. Soil and ecological inventories, soil quality assessments, and monitoring and evaluation are required program elements for soil conservation and protection of ecological functions. This directive establishes the management framework for sustaining soil quality and hydrologic function while providing goods and services outlined in forest and grassland land management plans.

1. Manage ecosystems to maintain or improve soil quality.

2. Collect and manage information about the properties, distribution, capabilities, condition, suitabilities, and limitations of soils associated with National Forest System lands in accordance with Agency inventory, monitoring, assessment and information management policies.

3. Use chemical, physical, and biological soil properties to assess existing soil condition for watershed condition and ecological assessments.

4. Use soil properties to assess the condition and potential affects on soils, when planning and implementing project activities.

5. Participate as an active partner in the National Cooperative Soil Survey (NCSS) program.

6. Implement established agency standards for soil and terrestrial ecological unit inventories.

2550.4 - Responsibility

2550.41 - Chief

The Chief has the responsibility to:

1. Ensure that soils on National Forest System lands are conserved and protected in order to maintain healthy watersheds that provide critical ecological services.

2. Ensure that soil resource inventory (SRI) and terrestrial ecological unit inventory (TEUI) meet established agency protocol standards and provide information for administering National Forest System lands and sustaining the production of goods and services for the American public.

3. Ensure Forest Service participation in the NCSS program and coordinate soil inventory activities and data sharing with all partners.

2550.42 - Deputy Chiefs

The Deputy Chiefs have the responsibility to ensure the Agency's soil management program is integrated across deputy areas.

2550.43 - Washington Office Director, Watershed, Fish, Wildlife, Air and Rare Plants

The Director of Watershed, Fish, Wildlife, Air, and Rare Plants has the responsibility to:

1. Develop and implement an Agency soil management program, ensuring that the program meets current Agency land management needs.

2. Coordinate soil quality management programs with Washington Office and regional staffs.

3. Develop and maintain national soil management direction.

4. Establish, maintain, and evaluate a core set of soil criteria and indicators to evaluate the status and trend of soil resources on National Forest System lands and guide the conservation and protection of those resources.

5. Coordinate validation studies of soil quality criteria and indicators with Forest Service Research and Development staff to ensure soil quality measurements are appropriate to protect soil productivity.

6. Ensure SRI and TEUI comply with established NCSS standards and address the business needs of the Agency.

2550.44 - Regional Foresters

Regional foresters have the responsibility to:

1. Provide strategic direction for all regional SRI and TEUI, soil quality, and soil management program activities.

2. Coordinate regional SRI, TEUI, and soil management programs.

3. Conduct periodic reviews of SRI and TEUI to ensure they comply with established Agency protocol standards and address the business needs, including interpretations, of Forest Service users.

4. Plan, execute, and publish SRI and TEUI as part of the NCSS.

5. Ensure that training in the use of soil assessments, analysis, and monitoring protocols is available and provided to appropriate staff.

6. Coordinate effectiveness monitoring programs at a regional scale.

7. Establish soil quality objectives and/or standards and revise when new scientific information or management direction is developed.

8. Coordinate with Research and Development in the selection of suitable methods for assessing and monitoring soil conditions and effects of management on soil quality.

9. Maintain consistency in procedures and methods for determining soil quality.

10. Assure that units apply the concepts of adaptive management in protecting soil quality. (FSM 1940)

2550.45 - Forest and Grassland Supervisors

Forest and grassland supervisors have the responsibility to:

1. Develop and implement a soil management program that maintains or improves soil productivity and watershed health on their administrative unit.

2. Conduct SRI and TEUI at an appropriate level, and comply with established Agency protocol standards to ensure the accomplishment of soil and ecological management objectives.

3. Develop, implement, and evaluate soil quality monitoring plans.

4. Enter resource data into appropriate corporate databases.

5. Use adaptive management processes to assure compliance with soil quality standards.

6. Ensure that training in the use of SRI and TEUI, assessments and analysis, monitoring protocols and results are available and provided to appropriate staff.

7. Provide leadership and resources to assess current condition, predict effects of proposed activities, and monitor soil quality.

8. Integrate soil quality objectives when designing and implementing multiple-resource assessment and monitoring projects.

9. Foster and realize opportunities for collaboration, cooperation, and coordination with partners, including the public, local, state, tribal, and other federal agencies; and non-governmental organizations.

2550.5 - Definitions

Desired Soil Condition. Soil physical, chemical, and biological properties that support the productive capacity of the land, its ecological processes, such as, hydrological function of watersheds, and the ecosystem services identified in land management plans.

Dynamic Soil Quality. An aspect of soil quality relating to soil properties that changes as a result of soil use and management or over the human time scale.

Ecological Type. A category of land with a distinctive (that is, mappable), combination of landscape elements. The elements making up an ecological type are climate, geology, geomorphology, soils, and the potential natural vegetation. Ecological types differ from each other in their ability to produce vegetation and respond to management actions and natural disturbances.

Inherent Soil Quality. An aspect of soil quality relating to a soil's natural composition and properties as influenced by the factors and processes of soil formation, in the absence of human impacts.

Permanent Soil Impairment. Detrimental changes in soil properties (physical, chemical, and biological) that result in the loss of the inherent ecological capacity or hydrologic function of the soil resource that lasts beyond a land management planning period.

Soil Analysis. Prediction of the effect of proposed management activities on future soil conditions.

Soil Assessment. An evaluation and interpretation of soil conditions of an area using scientific principles to describe existing conditions as they affect soil quality and sustainability. Assessments are generally non repeating observations of soil conditions. They provide the foundation of independent information upon which to build conservation strategies and management decisions; and against which alternative approaches can be evaluated and modified based on soil analysis. (FSM 1940.5)

Soil Condition. Description of the status of physical, chemical, and biological properties at any point in time. This may be a qualitative or quantitative description.

Soil Function. Any ecological service, role, or task that soil performs, such as the following:

Soil Biology. The presence of roots, fungi, and micro-organisms in the upper sections of the soil.

Soil Hydrology. The ability of the soil to absorb, store, and transmit water, both vertically and horizontally. Changes in soil bulk density, soil chemistry, soil structure, soil pores and ground cover can alter soil hydrology.

Nutrient Cycling. Soil stores, moderates the release of, and cycles nutrients and other elements. During these biogeochemical processes, analogous to the water cycle, nutrients can be transformed into plant available forms, held in the soil, or even lost to atmosphere or water.

Carbon Storage. The ability of the soil to store carbon.

Soil Stability and Support. Soil has a porous structure to allow passage of air and water, withstand erosive forces, and provide a medium for plant roots. Soils also provide anchoring support for human structures and protect archeological treasures.

Filtering and Buffering. Soil acts as a filter to protect the quality of water, air, and other resources. Toxic compounds or excess nutrients can be degraded or otherwise made unavailable to plants and animals.

Soil Monitoring. The collection of repeated soil observations or measurements to evaluate changes in condition and progress toward meeting a resource or management objective. A monitoring activity may include an information needs assessment; planning and scheduling; data collection, classification, mapping, data entry, storage and maintenance; product development; evaluation; and reporting phases. (adapted from FSM 1940.5)

Soil Productivity. The inherent capacity of the soil resource to support appropriate site-specific biological resource management objectives, which includes the growth of specified plants, plant communities, or a sequence of plant communities to support multiple land uses.

Soil Quality. The capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation and ecosystem health. There are two aspects of the definition: inherent soil quality and dynamic soil quality.

Substantial Soil Impairment. Detrimental changes in soil properties (physical, chemical, or biological) that result in the loss of the inherent ecological capacity or hydrologic function of the soil resource that lasts beyond the scope, scale, or duration of the project causing the change.

2550.6 - Technical References

These technical references are used in support of the soil management program.

Field Guide for Describing and Sampling Soils. The Field Guide provides standards for observing and recording soil and site characteristics.
http://soils.usda.gov/technical/fieldbook/

Forest Soil Disturbance Monitoring Protocol:

Volume I: Rapid Assessment. USDA Forest Service, General Technical Report WO-82a, September 2009. This technical guide outlines a framework for monitoring soil disturbance from forest management pre-activity and post-activity.
http://www.treesearch.fs.fed.us/pubs/34427

Volume II: Supplementary Methods, Statistics, and Data Collection. USDA Forest Service, General Technical Report WO-82b, September 2009. This technical guide provides the basis for a consistent method with common definitions to produce high-quality data that land managers can access and use for decision-making. http://www.treesearch.fs.fed.us/pubs/34426

Scientific Background for Soil Monitoring on National Forests and Grasslands: Workshop Proceedings: April 29-30, 2008, Denver, CO. USDA Forest Service Rocky Mountain Research Station, RMRS-P-59, 2010. International experts in the field of soil monitoring, soil monitoring indicators, and basic forest soil properties were brought together to describe the limits of our knowledge and the on-going studies that are providing new information. This workshop was developed to determine the state-of-the-science for soil monitoring on National Forests and Grasslands and laid the scientific basis for the Forest Soil Disturbance Monitoring Protocol. http://treesearch.fs.fed.us/pubs/35339

Interpreting Indicators of Rangeland Health (Technical Reference 1734-6). This interagency assessment procedure has been termed "rapid assessment," "qualitative assessment of rangeland health," and "visualization of rangeland health". http://www.blm.gov/nstc/library/pdf/1734-6.pdf

Keys to Soil Taxonomy. Agriculture Handbook 436 (Soil Taxonomy) Keys to Soil Taxonomy provides the taxonomic keys necessary for the classification of soils in a form that can be used easily in the field. http://soils.usda.gov/technical/classification/tax_keys/

Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems:

Volume I: Quick Start. This volume contains all of the information needed to begin monitoring. http://usda-ars.nmsu.edu/monit_assess/PDF_files/Quick_Start.pdf

Volume II: Design, Supplementary Methods and Interpretation. This volume outlines monitoring program development, contains supplementary methods, and provides guidelines for data entry. A Special Topics section in Volume II describes how to adapt the protocols to address more specific land management objectives and topics: riparian environments, livestock production, wildlife habitats, off-road vehicle and other recreation uses, fire, invasive species, state and transition models, and remote sensing. http://usda-ars.nmsu.edu/monit_assess/PDF_files/Volume_II.pdf

National Soil Survey Handbook. The National Soil Survey Handbook (NSSH) is a subdivision of the NRCS directives system. The NSSH provides operational and procedural policy and guidance for the soil survey program. http://soils.usda.gov/technical/handbook/

Soil Survey Manual. The Soil Survey Manual (SSM) provides in a single volume the major principles and practices needed for designing, conducting and using soil surveys and for assembling and using data related to them.
http://soils.usda.gov/technical/manual/

Soil-Disturbance Field Guide. USDA Forest Service, 0819 1815-SDTC, August 2009. The USDA Forest Service San Dimas Technology and Development Center developed the soil-disturbance field guide as a soil monitoring tool to identify soil disturbance classes. The technical guide provides photographs and detailed descriptions of examples from a wide range of climatic and vegetative types across the United States.
http://www.fs.fed.us/eng/pubs/

Soil Inventory, Monitoring, and Management Handbook. The Bureau of Land Management (BLM) Soil Inventory, Monitoring, and Management Handbook, H-7100-1, provides an Agency overview of approved technical procedures for conducting soil resource management functions on BLM managed lands, but also provides additional field guidance for resource managers and field personnel on NFS lands especially on intermixed or multi-jurisdictional lands.
http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/blm_handbooks.html

Terrestrial Ecological Unit Inventory Technical Guide: Landscape and Land Unit Scales. USDA Forest Service, General Technical Report WO-68, September 2005. The Terrestrial Ecological Unit Inventory Technical Guide (TEUITG) provides instruction and information on the development of the Terrestrial Ecological Unit Inventory (TEUI) for lands administered by the Forest Service. It provides a set of national standards, suggested methodologies, and a list of criteria for defining, describing, and classifying terrestrial ecological units and types.
http://www.fs.fed.us/biology/resources/pubs/soils/gtr_wo-68.pdf

2551 - SOIL QUALITY MANAGEMENT

2551.02 - Objective

Inform managers of the effects of land management practices on soil quality. Determine if adjustments to land management practices are necessary to sustain and restore soil quality.

Determine status and trend of ecological processes and functions through the evaluation of soil quality.

2551.03 - Policy

1. Use adaptive management (FSM 1905) to design and implement land management activities in a manner that achieves desired soil conditions and objectives as identified in the applicable land management plan.

2. Monitor resource management activities, and soil conditions and trends to ensure that soil and water conservation practices are implemented and effective.

3. Assess, analyze, and monitor the soil resource to detect changes in soil properties resulting from implementation of land management plans. Determine how changes in soil properties will affect desired soil conditions and objectives related to ecosystem function.

2551.1 - Assessments, Analysis, and Monitoring

Assessments, analysis, and monitoring are processes used to determine if desired soil quality conditions and objectives have been achieved. These processes also provide information to assist land managers in making informed decisions on how to maintain or improve long-term soil quality and the ecological functions they provide.

Soil assessments are conducted when knowledge of current soil quality conditions is required to advise decision makers whether adjustments in land management practices are needed.

2551.11 - Assessments

Soil quality assessment is the process of evaluating existing soil conditions based on an interpretation of soil properties affecting soil functions. Both past and on-going activities may contribute to existing changes in soil conditions. Include the type, degree, and amount of change in the assessment.

In order to assess changes in soil quality, establish a soil quality standard, reference, benchmark or desired condition to provide a "starting point" against which to measure changes. When possible, identify management activities or natural events that contributed to existing soil condition.

2551.12 - Analysis

Soil quality analysis is the process of predicting future soil condition. Soil analysis is commonly conducted as part of NEPA analysis for on-going or proposed management activities. Analyze on-going or proposed activities to determine if they will have an effect on soil quality.

Estimate the type, amount, and degree of change to soil indicators that the proposed activity may produce by using appropriate analysis methods, scientific literature, past monitoring results, and knowledge of local site and soil characteristics.

2551.13 - Monitoring

Soil quality monitoring is the process of evaluating changes in soil condition over time. Monitoring provides information to determine the soil condition and the cause and effect relationships associated with those conditions.

Use soil quality monitoring to validate and refine management decisions. The information collected allows land managers to determine if land management plan desired conditions are being achieved.

The major objective of soil quality monitoring is to ensure that ecologically sustainable soil management practices are being applied.

Monitoring is conducted to detect changes in physical, chemical, or biological soil properties caused by management activities. Monitoring should follow approved Agency protocols (See sec. 2550.6) and include any soil management direction found in land management plans. Specific items to monitor include:

1. Whether or not the plan direction was implemented as prescribed.

2. The effectiveness of the plan direction.

3. Identify and prescribe corrective measures needed to the plan direction.

4. Validation of assumptions and coefficients used in developing the plan direction.

2551.2 - Management Activities Associated with Assessment, Analysis, and Monitoring

Soil quality may be altered by past, on-going, or proposed future land management activities.

Past activities. The land management activity has been accomplished (such as an old timber sale, abandoned mine land, a prescribe burn).

On-going activities. Land management activities are occurring and current management direction has not changed (such as grazing, recreation use, road management, mineral lease).

Proposed activities. Land management activities have not started (such as timber sale, mineral lease). Proposed activities can include changes to direction for on-going activities (such as changes in grazing practices).

The following table displays soil quality tasks associated with land management activities:

Soil Quality Tasks	Land Management Activities		
	Past	On-going	Proposed
Assess	X	X	
Analysis		X	X
Monitor	X	X	X

2551.3 - Standards and Guidelines

Standards and guidelines are intended to prevent substantial and permanent damage or degradation that affects inherent ecosystem processes. Review the standards and guidelines in the land management plan periodically to determine if they are consistent with the best available science and revise as needed.

Generally, soil management standards and guidelines are not applied to administrative sites or dedicated use areas (such as roads, recreation sites). Standards and guidelines may apply to off-site impacts related to these sites and areas.

Consider the following in developing land management plan monitoring questions and associated the standards and guidelines:

1. Based upon current science and monitoring.

2. Based upon key soil functions and selected attributes/indicators/soil properties representing those functions.

3. Applied consistently across similar ecosystems and at appropriate scales.

4. Address different landscape scales to fit changing scales of land management activities.

5. Utilize soil management interpretations (risk ratings) useful for project planning and NEPA analysis.

6. Are practical, measurable, and support land management objectives.

7. Permit review and adjustment based upon new science and monitoring findings.

2551.4 - Methods to Determine Soil Quality

Use established or published protocols to assess, analyze, or monitor soil quality. Document the protocol used and ensure that it is appropriate for the scale and type of analysis being conducted. Examples are listed in section 2550.6.

Methods may be qualitative or quantitative.

1. Qualitative methods. Qualitative methods are generally used to make initial evaluations of the effects of management activities on soils. In most cases, qualitative estimates will be considered sufficient to meet assessment, analysis, and monitoring objectives.

   Use measurements and detailed sampling to calibrate visual methods and to conduct investigations where qualitative methods are inadequate or where benchmark sampling is required for comparison purposes.

2. Quantitative Methods. Quantitative methods are used that are appropriate for the soil properties and management effects that are being measured. The protocol that is used depends upon soil measurement objectives, duration (short or long term), and indicators that are chosen for measurement.

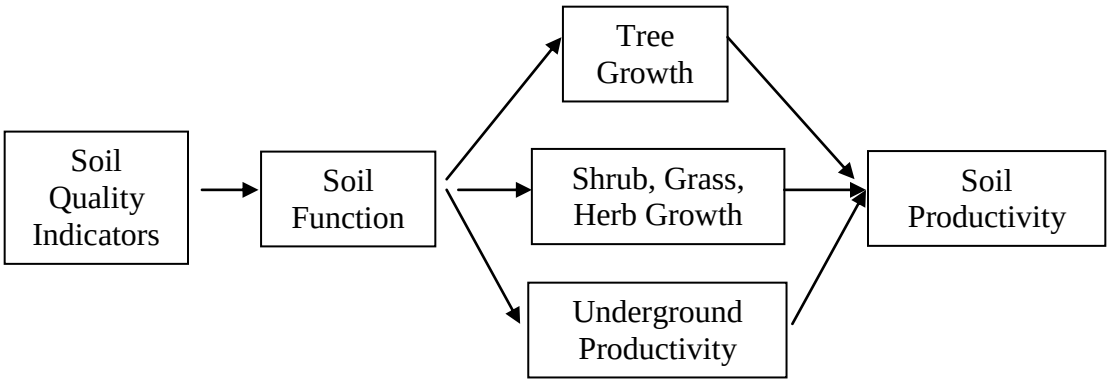
2551.5 - Soil Quality Indicators

Soil quality indicators are used to assess soil functions. Most soil quality indicators are observations and measurements taken at the soil surface and in the upper mineral soil. The condition at the soil surface and in the upper mineral soil strongly influences soil hydrology, biology, carbon sequestration, nutrient cycling, soil stability and support functions and in turn, long term soil productivity and ecosystem processes and functions.

It is important to realize that soil functions are interrelated with each other, as well as with other ecosystem functions. Understanding these interrelationships is essential to accurate interpretation of soil quality. The following exhibit (ex. 01) is intended to illustrate the relationship between soil quality indicators, soil function and soil productivity. Soil quality indicators are developed to give insights as to how well the inherent soil is functioning, i.e., biologically, hydrolgically, carbon storage, etc. The ultimate goal of the soil quality indicators is to provide information on the health of the soil.

2551.5 - Exhibit 01

Soil Quality Indicators Relationship to Soil Productivity



2551.6 - Monitoring Plans

2551.61 - Soil Quality Monitoring Projects and Plans

Incorporate soil monitoring requirements within administrative processes established for land management planning and project implementation. The focus of project level monitoring is observation and documentation of the implementation of soil protection prescriptions. The focus of forest plan monitoring is to gauge the progress toward achieving or maintaining the desired conditions and objectives, or other components of the land management plan. Issues or concerns on the effectiveness of prescriptions to meet standards and guidelines, or the validation of standards and assumptions to protect soil productivity may require additional monitoring projects.

2551.62 - Determining the Need for Monitoring Projects

Conduct problem analyses on major soil productivity issues or concerns derived externally or from land management plans, previous monitoring, or project level environmental assessments. Use an interdisciplinary team to determine the need and desired intensity for monitoring projects.

1. Developing Problem Statements. Prepare a clear, concise statement of the problem. The problem statement is the basis for establishing project objectives.

2. Review Past Related Work. Review available information from past monitoring projects as well as any applicable research literature. In some instances, other individuals may have recognized similar problems, performed investigations, and provided tentative solutions. Even if previous monitoring projects have been conducted in unrelated areas, they can often provide insights into possible sampling design and parameters to measure.

3. Documentation. The land management plan should include soil quality monitoring parameters as appropriate.

2551.63 - Preparing Soil Quality Monitoring Plans

Prepare plans for data intensive monitoring projects related to the land management plan direction or identified in an annual monitoring plan. Identify sampling requirements and/or procedures for monitoring in the annual soil quality monitoring plan for the administrative unit.

The soil quality monitoring plan must contain the problem statement and a description of methods to be used to meet project objectives. Involve research, other resource specialists, and land managers as appropriate. Prepare plans at an appropriate level of detail consistent with the issue or concern identified as part of the Forest planning process.

2551.64 - Soil Quality Monitoring Plan Contents

Include a statement of objectives, variables to be measured, study design, analysis techniques, and plans for reporting in Soil Quality Monitoring Plans. Include other components, as necessary, to meet objectives of soil monitoring projects. Additionally, soil quality monitoring plans should identify the techniques and methodologies used including scientific references for why a particular methodology was chosen.

2551.65 - Data Management

Enter soil quality monitoring data into an Agency approved corporate electronic database.

2552 - SOIL AND TERRESTRIAL ECOLOGICAL RESOURCE INVENTORIES

2552.02 - Objectives

1. Understand the limits and capabilities of soil and ecological resources on National Forest System lands.

2. Ensure compiled or derived soil resource inventory (SRI) or terrestrial ecological unit inventory (TEUI) data, maps and interpretations, including that from other National Cooperative Soil Survey (NCSS) participants meets the Forest Service business needs.

2552.03 - Policy

1. Conduct landscape level TEUI according to standards and procedures in the Terrestrial Ecological Unit Inventory Technical Guide (TEUITG).

2. Conduct landscape level SRI at the land unit scale (1:24,000 or less) according to the NCSS standards outlined in the USDA National Soil Survey Handbook (NSSH).

3. Ensure soil and ecological inventory data are preserved and maintained in electronic format in the appropriate Agency database(s).

2552.1 - Soil and Terrestrial Ecological Resource Inventory Planning

For landscape level SRI or TEUI see NSSH Parts 606, 607, 608, and 610 and TEUITG chapter 3. The following sections supplement guidance outlined in the above mentioned published technical guidance.

1. Inventory Priorities. Regions should develop a strategy to ensure the orderly completion of TEUI or SRI on all NFS lands.

2. Memorandum of Understanding (MOU). MOU(s) and/or work plans serve as a cooperative agreement with NCSS partners and govern the management and administration of the soils portion of the TEUI and address how NCSS standards will be achieved. Regional or project MOU(s) should be established when conducting progressive SRI or TEUI.

2552.2 - Field Operations

Organizing personnel, their necessary equipment and support is crucial to a successful inventory program. See NSSH Part 607 and SSM Chapter 4, and TEUITG Section 3.2.5 and Appendix H, These steps are most appropriate for Order 2 and Order 3 inventory, but can be used as a framework for planning of other inventory orders.

2552.3 - Classification, Correlation, Reports, and Maps

The following items are required to conduct landscape level TEUI or SRI on NFS lands.

1. Data Management. Data collected to support a TEUI or SRI must be entered into an Agency approved electronic database(s) and geospatially located using a global positioning system.

2. Soil Classification. The United States system of soil classification identifies sets of soil properties and groups them in taxonomic classes. See NSSH Parts 614, 627 and Keys to Soil Taxonomy for all soil classification parameters associated with SRI and TEUI.

3. Ecological Classification. The ecological classification process organizes and describes relationships between the inherent landscape elements; see TEUITG Section 3.2 and NSSH Part 627.

4. Quality Control, Quality Assurance, and Correlation. Quality control, quality assurance and correlation are conducted at a number of levels, but all inventory personnel must be familiar and understand correlation procedures including the population of Agency databases; see NSSH Parts 609 and 627 and TEUITG Sections 3.5.3, 3.5.4, and 3.5.5.

5. Interpretations. Soil and ecological data collected during the SRI and TEUI should be interpreted to address ecological capability, suitability, and limitations for major land uses in the inventory project area; see NSSH Part 607 and TEUITG Tables 3.6 and 3.7.

6. Inventory Reports. The purpose of inventory information is to transfer knowledge to those who make decisions about soil and ecosystem management. SRI and TEUI information may utilize several information delivery systems and is represented by different inventory products; see NSSH Part 644 and TEUITG Section 3.6.

7. Maps and Geospatial Coverages. This information consists of SRI or TEUI spatial data and map products are produced at a scale of 1:24000. Soil portions of SRI and TEUI are guided by the NSSH; see NSSH Part 644. TEUI projects produce ecological maps as described in the TEUITG; see TEUITG Section 3.5.3.

2552.4 - Project Level SRI and TEUI

Project level inventories are usually associated with management actions on relatively smaller areas of NFS lands. The above mentioned requirements for landscape level inventories may not apply to project level inventories except where the data is being compiled to validate an existing SRI or TEUI map or geospatial coverage. Additionally, where a SRI or TEUI is being considered, using the above mentioned requirements may assist in the formulation of and incorporation into a landscape level product.