Southern Regional Cooperative Soil Survey Conference

Bowling Green, KY

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Overview of Soils program in the Southern Region

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Vision

- Knowledge of soils and their properties, distribution, and behavior are recognized as essential to understanding ecosystem (watershed) composition, structure and function.

MISSION

- Integrate scientifically based soil information into management decisions and practices to sustain healthy, diverse, and productive ecosystems (watersheds) to meet the needs of present and future generations.

Role and Responsibility

The USDA Forest Service (FS) will:

- Participate in quality assurance reviews, field studies, and soil correlation for project soil surveys containing FS lands.
- Cooperate in the conduct of the National Cooperative Soil Survey by allowing access to intermingled lands and by conducting soil surveys on the lands under the jurisdiction of the Forest Service.
- Share available soil moisture and temperature, forestland and rangeland data.
- Cooperate in ensuring exact joins between soil survey areas.
- Provide guidance and assistance in other phases of the soil survey program.

- The National MOU between the NRCS and the Forest Service for soil survey was initially established in 1961. This amendment addresses completion of the initial soil survey on all NFS lands, each agency’s roles and sharing to soil data stored in corporate databases and acknowledges the need to address ecological site inventories.

- Currently standard soil survey and Terrestrial Ecological Unit Inventory (TEUI) has been completed on 133 million acres of NFS lands.

- After 2010 NRCS will increasingly be conducting soil survey on western NFS lands which are very different ecologically from the agricultural lands NRCS personnel have previously focused on. Non-agricultural lands (forests and rangelands) are less uniform and contain a wide variety of ecological plant communities not common on agricultural lands.

- Data quality assurance has been problematic between the two agencies especially in the western Regions. R-3 has been the most troublesome as it only recently has been collaborative with NRCS soil survey personnel. Other regions have been more successful in collaborating with NRCS.

- Ecological site descriptions are important to establishing benchmark monitoring sites especially for status and trend analysis and for describing and understanding vegetative desired conditions used in land management planning.

- BLM and the National Park Service often look to the Forest Service to advance coordination issues with the NRCS especially in soil survey and TEUI.
- The National NRCS MOU Amendment 2 – Related to the making of soil surveys on NFS lands addresses long-standing data sharing issues;
- Commits the NRCS to completing ecological site descriptions on all lands;
- Commits the FS to completing the initial soil survey and/or TEUI by the year 2025.

Key Points:

- Updates the completion date of the initial soil survey to 2025.
- Provides ready FS access to the NASIS database.
- Establishes the goal to complete ecological site descriptions on all NFS lands.
- Designates the FS and NRCS as quality control of soil data on NFS lands.

- Work consistently with NRCS officials to interject USFS's knowledge and long history of ecological classification and mapping into the ESD effort.

- Complete Landtype Association mapping on National Forest System lands (approx. 80% completion in the Southern Region).

Landtype Association Efforts

- LTA updates are being done in keeping with the National Hierarchical Framework of Ecological Units (Cleland et al, 1997) across all National Forests
- LTAs are being evaluated and, when necessary, subdivided or aggregated using recently available data
- Original LTA lines (where available) are being used as baseline

- LTAs are analogues to soil geomorphic units
- LTAs serve as analysis units for planning purposes
- In R8, Alabama, Texas, Mississippi have been completed. Appalachian Forests (NC, VA, TN, VA, KY, SC, GA) are underway. Florida, Louisiana and Arkansas (OK) will be completed by Fall 2012.

- In R8, mapping is being done primarily by Steve Simone (Resource Data Inc.) with review from Washington Office (Dave Cleland), Regional Office (Alix Cleveland) and National Forest ecologists. Eunice Padley is also a key leading participant.

National Soils Program Strategy for Soil Sustainability

National Soils Program Strategy for Soil Sustainability

Goals:

Ensure sustainable ecosystems through quality soil management
Ensure that budgets, skills and performance lead to quality land stewardship

National Soils Program Strategy for Soil Sustainability

Objectives:

- **Ensure that soil quality objectives are included as a component of ecosystem health and sustainability assessments**
- **Institutionalize NASIS as the National Hierarchy for conducting soil surveys, and provide for the spatial delineation and collaborative sharing of data at multiple-scales by various agencies**

- **Ensure that soils staffing and skills are tied to program emphasis areas and legal mandates to achieve quality land stewardship and be responsive to changing agency needs**

USDA Strategic Plan 2010-2015

Strategic Goal 2: Ensure Our National Forests and Private Working Lands Are Conserved, Restored, and Made More Resilient to Climate Change, While Enhancing Our Water Resources

OBJECTIVE 2.1 – RESTORE AND CONSERVE THE NATION'S FORESTS, FARMS, RANCHES, AND GRASSLANDS

- Restoring declining ecosystems and protecting healthy ones will ensure the Nation's lands are resilient to threats and impacts from a changing climate.

- It will also provide ecosystem benefits, food, fiber, and timber and non-timber products in a sustainable way. USDA will use the restoration of watershed and forest health as a core management objective of the National Forests and Grasslands.

OBJECTIVE 2.2 – LEAD EFFORTS TO MITIGATE AND ADAPT TO CLIMATE CHANGE

- Climate change is one of the great challenges facing the United States and the world.

- The agricultural sector accounts for approximately 6 percent of total U.S. greenhouse gas emissions, while U.S. lands (primarily forests) absorb approximately 12 percent of total U.S. greenhouse gas emissions.

- Restoring declining ecosystems and protecting healthy ones will ensure the Nation's lands are resilient to threats and impacts from a changing climate. It will also provide ecosystem benefits, food, fiber, and timber and non-timber products in a sustainable way.

- USDA will use the restoration of watershed and forest health as a core management objective of the National Forests and Grasslands.

- Restoring declining ecosystems and protecting healthy ones will ensure the Nation's lands are resilient to threats and impacts from a changing climate. It will also provide ecosystem benefits, food, fiber, and timber and non-timber products in a sustainable way.

- USDA will use the restoration of watershed and forest health as a core management objective of the National Forests and Grasslands.

- USDA programs will help public and private land managers reduce greenhouse gas emissions and increase carbon sequestration on farms, ranches, and forestlands

OBJECTIVE 2.3 – PROTECT AND ENHANCE AMERICA'S WATER RESOURCES

- Protecting America's supply of clean and abundant water is among the most crucial environmental challenges of the 21st century. Water is essential for life.

- This precious resource is the foundation for healthy ecosystems, sustainable agricultural and forest production, livable communities, and viable industry.

- As water flows from forested headwater streams, through wetlands, over rural agricultural lands and urban watersheds to estuaries and oceans, USDA will strategically invest its resources to prioritize and accelerate the protection of water resources.

OBJECTIVE 2.4 – REDUCE RISK FROM CATASTROPHIC WILDFIRE AND RESTORE FIRE TO ITS APPROPRIATE PLACE ON THE LANDSCAPE

- Wildfires have a natural role on our landscape. Many forests, rangelands, and grasslands are actually dependant on fire for ecological health and sustainability.

- Impacts from climate change, drought, and the accumulation of flammable vegetation, combined with the increasing development in fire-prone areas, are causing more severe fires on the landscape and potentially increased damage to communities.

- Preventing catastrophic wildfires is also important for ecological and watershed health. At the same time, restoring fire to natural areas that are fire-dependant ecosystems will help reduce fuel loads, lessen the risk of damaging fires, enhance wildlife habitats, and restore ecological and watershed function and resiliency.

Program Components

- Inventory
- Monitoring
- Assessments
- Support Services
- Water Resource Management
- Riparian and Wetland Management
- Restoration/Improvements

R8 Inventory Status & Needs

National Forest	State	County	MO	MLRA	SRI Type	NF's Acreage	Acres Plan (Date)	Acres Accom (Date)	Acres Remaining
NF's in AL	**Alabama**					667,274			
		Winston		AL133	Update	89,474	20,000 FY-10	50,000 FY-10	19,474
					Update		20,000 FY-2011	20,000 FY-11	0
		Bibb		AL007	Update	60,697	60,697 FY 01-07	60,697 FY-2008	0
		Lawrence			Update	90,332	Initiate FY-2012		90,332
El Yunque NF						28,002	28,002 FY 00-02	28,002 FY-02	0
Chatt/Oc NF's	**Georgia**					864,424			Completed
		Dade &walker	MO 18	128 & 129	On-going	18,844	0	FS-completed	0
		Greene	MO 14	133	On-going	26,659	Completed 1986	FS completed	0
		and		GA648	Update	62,645	62,645 FY-2002-2007	62,645 FY-2008	0
Cherokee NF	**Tennessee**					636,797			Complete
		Unicoi			Digitized Cherokee NF's	56,897	56,897 FY-2008	56,897 FY-09	0
		Menifee			Update	13,000			

National Forest	State	County	MO	MLRA	SRI Type	NF's Acreage	Acres Plan (Date)	Acres Accom (Date)	Acres Remaining
DBNF	**Kentucky**					557,789			0
DBNF's continues		McCreary			Update	1,099			0
		Whitley			Update	9815			0
		Pulaski			Update	37,41			0
					Update	62,428			0
		Rockcastle			Update	14,793			0
NF's FL	**Florida**					1,112,489			
		Liberty		FL077	Updated FY-08	267,298	267,298 FY-2007	267,298 FY-08/09	0
Ocala NF	**FL**	,Marion & Putnam		FL609	Update	383,595	30,000 FY-2010	On-going	353,595
							30,000 FY-2011	On-going	312,700
							50,000 FY-2012	On-going	262,700

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom	Acres Remaining
FMS NF's	**South Carolina**					623,724			
Sumter NFs		Newberry			Digitize Updates using LiDAR Technology with field verification	58,974	300 ac. FY-09		58,974
					Update Newly Acquired Lands	2,379			2,379
		Union			Digitize Updates using LiDAR Technology with field verification	62,313	1700 ac. FY-09		62,313
					Update Newly Acquired Lands	1,560			1,560
		McCormick			Digitize Updates using LiDAR Technology with field verification	51, 235			51, 235
					Update Newly Acquired Lands	2, 052			2,052

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
		Abbeville			Digitize Updates using LiDAR Technology with field verification	23,349			23,349
					Update Newly Acquired Lands	85			85
		Oconee			Digitize Updates using LiDAR Technology with field verification	84,574			84,574
					Update Newly Acquired Lands	4,000			4,000
		Edgefield			Digitize Updates using LiDAR Technology with field verification	31,113			31,113
		Greenwood			Digitize Updates using LiDAR Technology with field verification	10,951			10,951

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
		Laurens			Digitize Updates using LiDAR Technology with field verification	20,941			20,941
		Saluda			Digitize Updates using LiDAR Technology with field verification	4,480			4,480
		Chester			Digitize Updates using LiDAR Technology with field verification	12,647			12,647
		Fairfield			Digitize Updates using LiDAR Technology with field verification	11,080			11,080
Francis Marion	**SC**	Berkeley			Ongoing Field Updates	193,982	8,000 FY-10	36,000 FY-05-10	157,982
					Digitize Updates using LiDAR Technology with field verification	193,982	Top Priority as funds become available		193,982

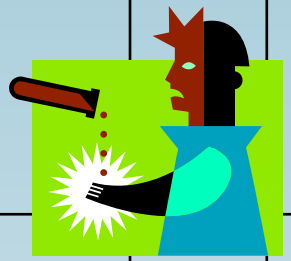
National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
Francis Marion continues		Berkeley			Update Newly Acquired Lands	55			55
		Charleston			Ongoing Field Updates	64,960		12,000 FY05-08	52,960
					Digitize Updates using LiDAR Technology with field verification	64,960	Top Priority as funds become available		64,960
					Update Newly Acquired Lands	317			317
GW NF	**Virginia**					960,303			Mapping meets NRCS Std.
Jeff NF's	**Virginia**					704,572			Mapping meets NRCS Std.
GW NF	**West Virginia**					105,099			Mapping meets NRCS Std.
Jeff NF's	**West Virginia**					18,530			Mapping meets NRCS Std.

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
GW/Jeff NF's Total	**Virginia**					1,664,071			Mapping meets NRCS Std
GW/Jeff NF's Total	**West Virginia**					123,629			Mapping meets NRCS Std
		Dickerson			Update	8,000	FY-07		Final Correlation pending
Kisatchie	**Louisiana**					603,393			Mapping meets NRCS Std
NF's in Miss	**Mississippi**					1,170,816			0
		Jasper			Update	85,299			
		Green			Update	33,366	10,000 FY-2010	23,000	Complete
					Un-pub	23,000			
		Perry			Un-pub	162,821			
		Smith			Unpub	72,676			

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
		Sharkey			1960 pub.	60,215			0
		Wayne			Update	90,146			0
NF's in MS continues		Stone			Un-pub	54,919			0
					Digitize Needed	95,596			0
		Wilkinson			Un-pub	22,803			0
		Winston			Un-pub	28,586			0
NF's in NC	**North Carolina**					1,254,876			0
				NC089	Update	17,295			Complete
		Cherokee		NC039	Update	93,058			Complete
		Caldwell		NC027	Extensive Revision	49,416			
		McDowell		NC111	Extension Revision	73,640			

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
		Jones		NC103	Extension Revision	39,987			
Ouachita	**Arkansas**					1,423,591			0
		Yell			Update	110,000			
		Perry				90,000			
Oz/St Francis NF's	**Arkansas**					1,138,176			0
				AR143	Update	21,681			
NF's in Texas	**Texas**								
				TX419	Update	67,792			
				TX471	Update	54,074			
		Dallam		TX111	Update	77,463			
		Gray		TX179	Update	1,124			
		Hemphill		TX211	Update	576			
		Montague		TX337	Update	61			

National Forest	State	County	MO	MLRA	SRI Type	NF'S Acreage	Acres Plan	Acres Accom (Date)	Acres Remaining
LBL	**Kentucky**					106,458			0
		Lyon				45,692			0
	Kentucky	Trigg				60,766			0
	Tennessee	Stewart			On-going	63,852	35,000		0



Region 8 Existing Staffing Level
(May 24, 2012)

National Forest	# Soil Scientist Positions	Hydrologist Positions	# Current SCSEP	# Trainee
NF's AL	1 (<3yrs. retirement eligible)			0
El Yunque		0.25		0
Chatt/Oconee NF's	1 (<3yrs. retirement eligible)			0
Cherokee NF's		1		0
Daniel Boone NF	1	1 (<3yrs. retirement eligible)		0
NF's in FL	0	0		0
FM&S NF's	1	1 (<3yrs. retirement eligible)		0
GW/Jeff NF's	1 (<3yrs. retirement eligible)	1 (<3yrs. retirement eligible)		0
Kisatchie NF	0	0		0
NF's in MS	1	0		0
NF's IN NC	0	1		0

Region 8 Existing Staffing Level
(May 24, 2012)

National Forest	# Soil Scientist Positions	Hydrologist Positions	# Current SCSEP	# Trainee
Ouachita NF	1	1	0	0
Ozark ST. Francis NF's	1 (<3yrs. retirement eligible	1	0	1-Mason
NFGT	0	0	0	
LBL	1	0	0	0

- **Monitoring**

Planning Rule: (Effective 1-28-2012)

1920.12-Regulations

- Under the authority of Title 36, Code of Federal Regulations, Part 219—Planning, Subpart A—National Forest System Land Management Planning, published January 5, 2005 (70 FR 1023) plans may be developed, revised, amended, or administratively changed under the 2012 planning rule (January 5, 2005 (70 FR 1023).

- Plan development and plan revisions initiated after (Month, day, year) must conform to the requirements of the 2012 planning rule.

- Under the 2012 planning rule, some plan amendments or plan revisions may use provisions of the prior planning regulation.

- The provisions of the prior planning regulation can be used under the following conditions: (see 36 CFR 219.17):

36 CFR 219.17

- 1. Plan development, plan amendments, or plan revisions initiated before January 5, 2005 may be completed using the provisions of the prior planning regulation or conform to the requirements of the 2012 planning rule. The responsible official must give public notice (see 36 CFR 219.16(a)(5)) if the ongoing planning process is changed to the 2012 planning process.

- 2. Plan amendments initiated during the transition period (three years from (Mouth, Day, Year) (36 CFR 219.17 (b)(2)) may be initiated and completed under the provisions of the prior planning regulations or they may conform to the 2012 planning rule provisions. Any plan amendments initiated after the transition period must conform to the 2012 planning rule provisions.

- 3. For units with plans developed, revised, or amended using the provisions of a prior planning regulation, no obligations remain from any prior planning regulations, except those that are specifically included in the plan.

1920.2 – Objectives

Objectives of land management planning are to:

- 1. Sustain the multiple uses of the National Forest System land's renewable resources in perpetuity while maintaining the long-term health and productivity of the land consistent with the Multiple-Use Sustained-Yield Act of 1960 (36 CFR 219.1(b)).
- 2. Promote the ecological integrity of national forests and grasslands (36 CFR 219.1(c)) through the collaborative, science-informed development, revision, or amendment of land management plans.

- 3. Guide management of National Forest System lands so that they are ecologically sustainable and contribute to social and economic sustainability, with ecosystems and watersheds with ecological integrity, diverse plant and animal communities, and capacity to provide people and communities with a range of social, economic, and ecological benefits for the present and into the future (36 CFR 219.1(c)).
- 4. Conduct all aspects of land management planning in a timely, efficient manner and within the fiscal capability of the unit (36 CFR 219.1(g)).

1926.71 – Monitoring Requirements

- 1. Focus monitoring on those activities that:

i. Affect significant management systems such as total silvicultural systems and other monitoring requirements.

ii. Are responsive to stated issues, concerns, and management opportunities.

iii. c. Affect major components of the environment.

- 2. Coordinate monitoring efforts with resource inventory needs to reduce duplication.
- 3. Monitor to ensure that:

i. The land management plan complies with applicable laws and regulations.

ii. Cumulative effects of project implementation do not exceed standards or thresholds stated in the land management plan.

iii. c. Planned mitigation actions are implemented and maintained as designed

4. USE OF BEST AVAILABLE SCIENTIFIC INFORMATION IN THE LAND MANAGEMENT PLANNING PROCESS

- The best available scientific information (BASI) will be used in development of the plan.

- BASI is information the responsible official determines has the greatest degree of accuracy and authenticity based on sound logic, good judgment, reasoning, or evidence.

- The best scientific information may be generated using the scientific method that includes hypothesis testing, adequate experimental and statistical design, independent peer review of results, and verification through field-testing.

- When an area of science is not settled, the best available scientific information may not meet the highest level of reliability.

- Occasionally the best information available may be, in decreasing order of value, fair research-based information, expert opinion, panel consensus, or observations.

- The responsible official must have access to and use BASI. Use of BASI increases the understanding of risks and uncertainties and improves assumption made in the course of decision making.

BASI Determination Process

Review the available scientific information and determine which is the “best”, that is, the most accurate, reliable, and relevant information for the particular matter under consideration.

The characteristics generally to be expected in a valid scientific process are as follows:

- 1. Information has been appropriately peer reviewed. This occurs when scientific information has been critically reviewed by qualified scientific experts in that discipline and the criticism provided by the experts has been addressed by the proponents of the information. Publication in a refereed scientific journal usually indicates that the information has been appropriately peer-reviewed.

- 2. Sound methods have been used. The methods used to obtain the information must be clearly stated . Either standardized methods for that discipline were used or, if not, the methods were appropriately peer-reviewed to assure their reliability and validity.

- 3. Logical conclusions and reasonable inferences were drawn.

- The conclusions presented are based on reasonable assumptions supported by other studies and consistent with the general theory underlying the assumptions.
- The conclusions are logically and reasonably derived from the assumptions and supported by the data presented.

- Any gaps in information and inconsistencies with other pertinent scientific information are adequately explained.

- 4. Quantitative analysis. The data have been analyzed using appropriate statistical or quantitative methods.

- 5. Context. The information is placed in proper context. The assumptions, analytical techniques, data, and conclusions are appropriately framed with respect to the prevailing body of pertinent scientific knowledge.

- 6. References. The assumptions, analytical techniques, and conclusions are well referenced with citations to relevant, credible literature and other pertinent existing information.

- The process used to determine the BASI must be documented in the assessment report, the plan decision document and the monitoring evaluation reports.

Such documentation must:

1) identify what information was determined to be the BASI;

2) explain the basis for this determination; and

3) explain how the information was applied to the issues considered. (See sec. 41.2 for information on scientific reviews.)

4) identify uncertainties

Soils and Soil Productivity

- The Responsible Official must develop plan components, including standards or guidelines, to maintain or restore soils and soil productivity, including guidance to reduce soil erosion and sedimentation. Desired conditions for soil physical, chemical, and biological qualities include sustaining the productive capacity of the land, its ecological resources, and watershed functions.

- Develop plan components that maintain integrity of soils through managing vegetative communities and the type and amount of disturbance. Give particular consideration to those soils that have been identified as vulnerable to stressors and develop plan components to mitigate impacts.

- Develop standards and guidelines to mitigate the effects of activities on sites where objectives and suitability designations are not sufficient for maintaining soil productivity, or where specific guidance is needed to restore degraded areas.

Consider the following approaches to developing plan components:

- 1. Interpretations in soil surveys certified by the National Cooperative Soil Survey (NCSS).
- 2. A Terrestrial Ecological Unit Inventory (TEUI) may contain information on vegetation suitability and productivity, and NRV, in addition to the standard soil interpretations.

- 3. Units that do not have a soil inventory or a TEUI may have options for developing information to maintain soil productivity by using remotely sensed data to derive approximations of soil-landform units, and for developing attribute data from existing spatial information.

- 4. Expert opinion should be gathered and documented, to be used in areas where soil inventories or TEUI are incomplete, or to supplement existing information with local knowledge.

- Consider the potential impacts of climate change and how it may affect appropriate uses of soils. For example, wet soils that could withstand equipment operations under frozen conditions in northern latitudes are now less operable in winter because frozen conditions have become unpredictable.

- Soils with poor moisture holding capacity are likely to be increasingly impacted by drought, and low-lying areas may flood more frequently as extreme storm events become more common. Also consider the potential for increased erosion resulting from storms with heavy rainfall.

- Plan components should address potential impacts on soil physical properties, including compaction, rutting, puddling, displacement of the soil surface, and erosion. Recommendations contained in best management practices for water quality address many aspects of protecting soil physical characteristics. Additional information is found in FSM 2551.3.

- Consider soil chemical properties, such as potential for nutrient depletion, and/or acidification. Determine which nutrients are growth-limiting in the plan area, and what impacts management systems have on nutrient pools in various vegetation types. Develop standards or guidelines for nutrient management, or limitations on the amount of nutrient removal, where appropriate.

- Consider biological properties of soils, such as, appropriate level of organic matter input to sustain biological cycling. NRV

- Consider plan components that maintain organic matter inputs and avoid losses, to contribute to maintaining or increasing net soil carbon storage. Carbon storage and cycling is an increasingly important aspect of soil management, as soil contains the largest terrestrial carbon pool.

Assessments

Soil Assessments

- Assemble and evaluate existing information on soils and sites, including geology and geomorphology, and other components of the terrestrial physical environment important to ecological integrity and soil quality (defined in FSM 2550.5).

- 1. Identify key attributes/characteristics of soils and sites that make them susceptible to loss of integrity resulting from specific uses, disturbances, or environmental change.
- 2. Identify existing impairments, such as critical loads, acidification, or invasive species impacts.
- 3. Using Terrestrial Ecological Units or soil map units, identify the locations of vulnerable sites and/or degraded sites.

When soil resources are a relevant issue in the planning process, the responsible official should:

- 1. Evaluate soil quality for its ability to maintain ecological functions to sustain the land's ability to provide multiple uses and ecosystem services in perpetuity.
- 2. Identify current inventories of soil conditions and improvement needs.
- 3. Identify the locations of sensitive soils, including their geology and geomorphology, and other relevant components of the terrestrial physical environment important to ecological integrity and soil quality (defined in FSM 2550.5).

Water Assessments

- Characterize and evaluate the status of water resources (surface and ground water) and their role in terrestrial and aquatic ecosystems within the plan area. Include:
- The quantity, quality, timing, and distribution across the plan area.
- The nature, extent, and role of existing and reasonably foreseeable future water withdrawals and associated infrastructure and uses.
- Assess the range of variability of water resources under which the hydrologic systems developed.

- From the natural range of variation, identify flow regimes needed to sustain the integrity of the biotic and abiotic integrity of aquatic ecosystems.
- Describe reasonably anticipated future patterns of perturbation (i.e., flood, drought, altered precipitation and/or evapotranspiration patterns, etc.).
- Evaluate the effects of land use and management activities on hydrologic processes and water resources.

When water resources are a relevant issue in the planning process, the responsible official should, at the appropriate hydrologic unit code watershed scale:

- 1. Consider the information for the 12 indicators generated through the Watershed Condition Classification portion of the Watershed Condition Framework and the identified priority watersheds for restoration.
- 2. Identify the location and extent of known groundwater resources and groundwater-dependent ecosystems such as cave and karstic systems, cold-water streams and lakes, riparian areas, seeps, springs, and wetlands (including fens);
- 3. Consider whether water resources with water availability, quality, or timing issues need additional plan components for contributing to sustainability of aquatic ecosystem diversity (sec. 43 of this handbook) and existing human uses;

- 4. Identify the plan area's current and reasonably anticipated water needs for consumptive, non-consumptive (such as, for recreation, species and habitat conservation and restoration, etc.), and storage purposes, and the options available for additional plan components to coordinate with the State's water allocation process, consistent with FSM 2540; and

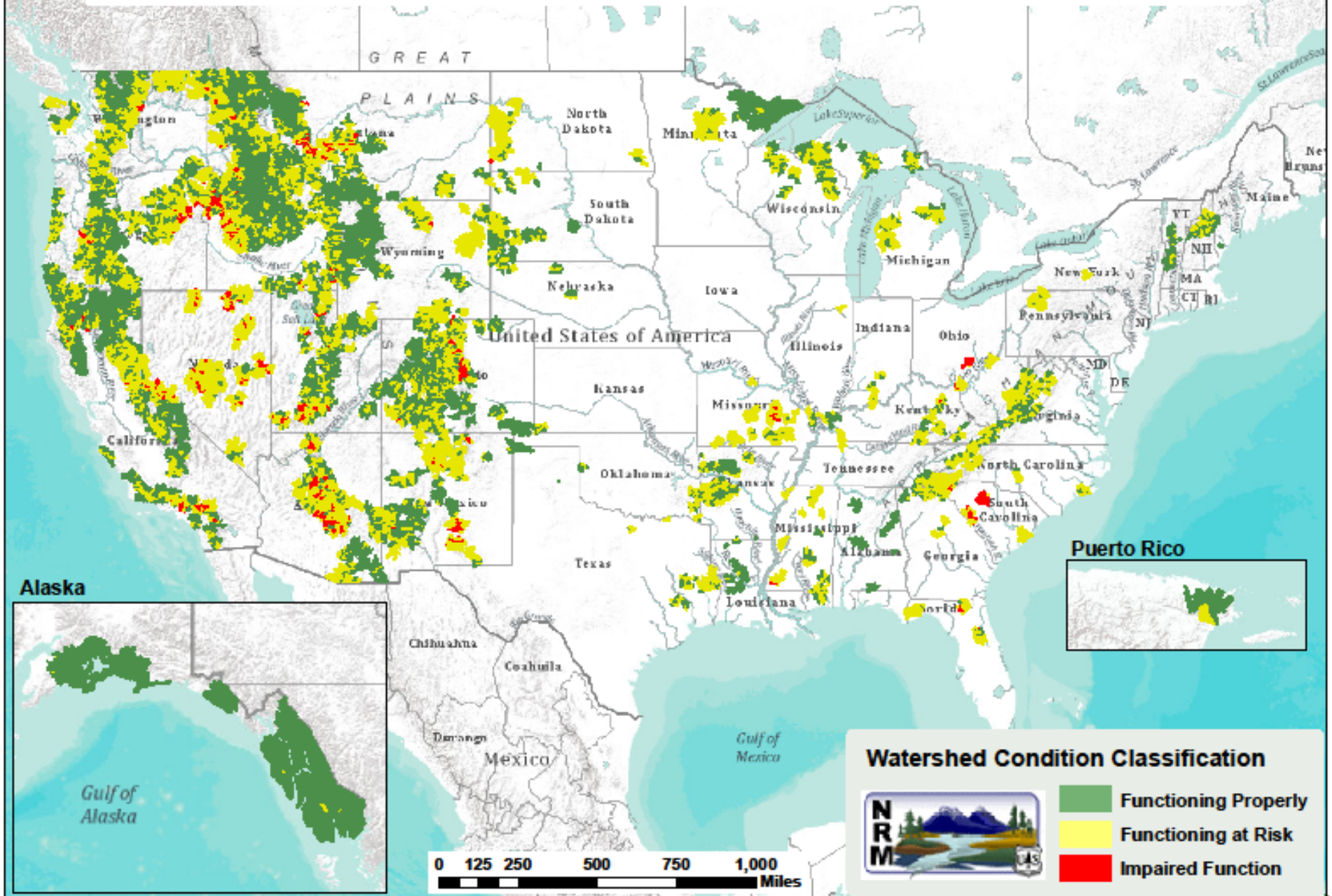
- 5. Identify impaired or contaminated waters within or adjacent to the plan area. This would include current Clean Water Act Section 303(d) and Section 305(b) listed waters (33 U.S.C. 1313(d), 1314(b)), facilities with surface or groundwater contamination designated under CERCLA or RCRA for cleanup, or other known areas of surface or groundwater contamination.

- 6. Identify the location of existing and reasonably foreseeable water withdrawals and diversions, water storage facilities (surface and subsurface), municipal watersheds, and source water protection areas within the plan area.

USDA Forest Service Watershed Condition Classification

Ratings based on assessments of National Forest System land in sixth-level watersheds

MAY 12, 2011



- 0 125 250 500 750 1,000
- Miles
- Watershed Condition Classification
- Functioning Properly
- Functioning at Risk
- Impaired Function
- Alaska
- Puerto Rico
- USDA Forest Service Watershed Condition Classification
- Ratings based on assessments of National Forest System land in sixth-level watersheds
- MAY 12, 2011

Monitoring

Monitoring soil productivity (productivity of the land)

The Responsible Official must include in the plan monitoring program questions and associated indicators addressing the effects of each management system, i.e., even-aged and uneven-aged silvicultural system for timber management, **to determine that they do not substantially and permanently impair the productivity of the land** (16 U.S.C. 1604(g)(3)(C)). Key ecosystem characteristics related to soils and soil productivity identified in assessments and carried forward into the plan as plan components should be the focus of this monitoring item.

- Soil quality monitoring guidance is found in FSM 2551.6, and soil disturbance monitoring protocols are described in GTR WO-82a. **Soil quality monitoring may include disturbance monitoring** as well as measures of chemical and biological properties, and physical properties beyond soil disturbance. Coordinate with Research Stations to obtain results from the Long-Term Soil Productivity Study for the region around the plan area, to solicit input to the monitoring design, and to identify concerns related to organic matter/carbon loss and soil compaction.

Monitoring Watershed Conditions

- The Responsible Official must include in the monitoring program questions and associated indicators addressing the status of select watershed conditions (219.12 a (5) (i)
- As part of the plan monitoring program, NFS units shall develop a monitoring program that evaluates whether desired conditions for water quantity, quality, timing, and distribution across the plan area are being achieved.

- Key ecosystem characteristics related to water resources and watershed conditions identified in assessments and carried forward into the plan as plan components should be the focus of this monitoring program.

- Such a program could include a set of primary and secondary indicator parameters related to these key characteristics that could be periodically measured and assessed through techniques such as remote sensing and field data collection and used to evaluate success in achieving desired plan conditions for watersheds.

- 1. Watershed Condition Framework Step F monitoring procedures, when completed, will provide a basis for consistently characterizing and assessing watershed condition. NFS units shall utilize periodic blanket application of the Watershed Condition Classification process (WCF, Step A) and targeted implementation of WCF Step F monitoring procedures on select watersheds to monitor watershed condition.

- 2 NFS units, in cooperation with the regions, the Washington Office, and other partners shall develop and implement a statistically-based program of water quality monitoring of all major types of surface and ground waters in targeted watersheds and aquifers across the planning unit.

Forest Soil Disturbance Monitoring

Best Management Practices

- First BMP technical guide released April 24,2012.
- The National BMP Program was developed to improve the agency performance and accountability in managing water quality consistent with the Federal Clean Water Act (CWA) and State water quality programs.
- It directs compliance with required CWA permits and State regulations and requires the use of BMPs to control nonpoint source pollution to meet applicable water quality standards and other CWA reguirements.

Why are BMP's needed?

A standardized Nation BMP Program is needed as and effective tool for the agency to accomplish the following:

- Improve water quality to restore impaired waters.
- Improve relationships with EPA, States, and the public.
- Improve the agency's ability to demonstrate results in watershed management.

- Improve the agency's ability to use adaptive management in land management plan implementation.
- Improve National Environmental Policy Act analysis and compliance with other Federal laws.

BMP Components

1. A set of National Core BMPs

2. A set of standardized monitoring protocols to evaluate implementation and effectiveness of those BMPs

3. Data management and reporting structure.

4. National direction.

National Forest Focus Areas:

- Watershed Condition
- Climate Change
- Ecosystem Sustainability
- Fuel Management

Challenges

- Maintaining Skills and Providing Career Opportunities.
- Conducting proper soil resource effects analysis, developing landscape or Forest-level plans
- Developing watershed restoration projects, and assessing soil quality at current organizational
- Difficulty to employ entry-level soil scientists to adequate maintain an adequate skill pool into the future. It also must develop career ladders for scientists within their specialty so that it can recruit and retain highly qualified and motivated staff.

- Transitioning to an "All Lands, Seamless Boundary" management concept
- Keeping SRI relevant because of land acquisition
- Funding issues on "Augmentation of Federal Funds (EWP)
- Retirement Attrition
- Execution of unfunded mandates
- Meeting Critical Operational Functions with current workforce

Opportunities & Conclusion

- Implementation of Watershed Condition Framework.
- Implementation of BMPs
- Implementation of SQM Protocol
- Cross-Training through NRCS Technical Training Centers.
- Transition of Soil Descriptions into Pedon-PC

- THANKS NRCS FOR OVER 60 YEARS OF NCSS COLLABORATIVE PARTNERSHIP

- QUESTIONS??

Benchmark Forest soils

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