

Ecosystem Services and National Forest Land Management Plan Revisions

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Talk Outline

- Introduction to Basic National Forest Planning
- Planning Rule and Directives
- What are key ecosystem services?
- What is expected of key ecosystem services in land management plans and supporting NEPA documentation?
- Key ecosystem services identified in assessments
- Questions/Discussions



Governance of National Forest Activities

National Forest Management Act

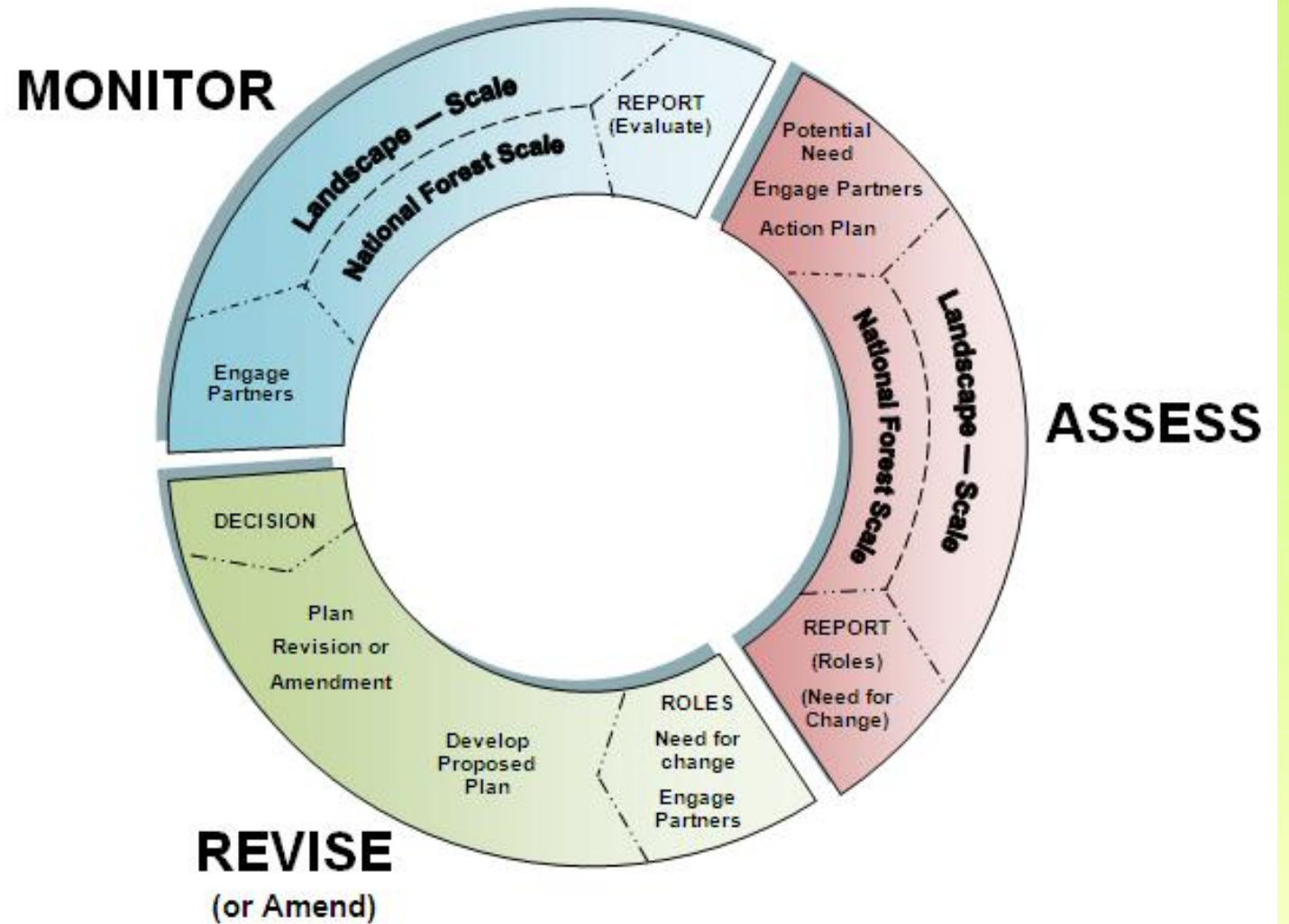
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graph TD; A[National Forest Management Act] --> B[Forest Service Planning Rule]; B --> C[Land Management Plans (Forests/Grasslands)]; C --> D[Project or Activity Decision];
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Forest Service Planning Rule

Land Management Plans (Forests/Grasslands)

Project or Activity Decision

Adaptive Planning cycle



Ecosystem Services and the 2012 Planning Rule

36 CFR 219.1 Purpose and applicability

*“(c)..... Plans will guide management of NFS lands so that they...have the capacity to provide people and communities with **ecosystem services** and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.”*

Ecosystem services and the 2012 Planning Rule

219.6 Assessment

(b) Content of the assessment for plan development or revision. the responsible official shall identify and evaluate existing information relevant to the plan area for the following:

*(7) Benefits people obtain from the NFS planning area (**ecosystem services**);*

Planning rule requires

The plan must provide plan components, including standards or guidelines, to guide the plan area's contribution to social and economic sustainability, taking into account..

- **(4) Ecosystem services (36 CFR 219.8)**

*the plan must provide for **ecosystem services** and multiple uses including outdoor recreation, range, timber, watershed, wildlife and fish, within Forest Service authority and the inherent capability of the land as follows:*

*(a) Integrated resource management for multiple use. The plan must include plan components including standards or guidelines, for integrated resource management to provide for **ecosystem services** and multiple uses in the plan area... the responsible official shall consider:*

*(1) ... **ecosystem services**...*

(36 CFR 219.10)

Ecosystem Services

Provisioning services

Food (crops, livestock, wild foods, etc.)

Fiber (timber, cotton/hemp/silk, wood fuel)

Genetic resources

Biochemicals, natural medicines, pharmaceuticals

Fresh water

Regulating services

Air quality regulation

Climate regulation (global, regional, and local)

Water regulation

Erosion regulation

Disease regulation

Pest regulation

Pollination

Natural hazard regulation

Supporting services

Nutrient cycling

Soil formation

Primary production

Cultural services

Aesthetic values

Spiritual and religious values

Recreation and ecotourism

Planning rule does not require:

- Providing plan components for each and every ecosystem service.
- Achieving a specific level of ecosystem services.
- Separation of ecosystem services from multiple uses. Integrated resource management is stressed.
- Valuation (non-market values) of specific ecosystem services in land management plans.

This is at the discretion of the responsible official for the planning effort.

Ecosystem services and the planning directives FSH 1909.12-Assessment

- Assessment Section 13.2 - Assessing Benefits
People obtain from the NFS plan area

The responsible official should identify and evaluate **key ecosystem service provided by the plan area that may be influenced by the land management plan.**

What are key ecosystem services?

- Two criteria in the proposed directive (13.2)
 - **Importance beyond the plan area**
 - **Likely to be affected by the plan**

What are key ecosystem services?

		Is this service important to people in the broader landscape?	
		Yes	No
Is this service likely to be affected by the plan?	Yes	Key Ecosystem service	Likely to be affected by the plan, but not identified as important (i.e. one of many sources) in the broader landscape.
	No	The service is important in the broader landscape, but not likely to be affected by the plan.	Not identified as important (i.e. one of many sources) in the broader landscape and not likely to be affected by the plan.

Example: Air Quality

National Forest A:

- High visitation to view foliage in summer and fall
- Substantial program of prescribed fire also conducted in late summer and fall.
- Visibility is affected by smoke in late summer fall. Controversy over burning program vs. mechanical treatment.

Is Air Quality a Key Ecosystem Service on National Forest A?

- Scenery and visitation is important beyond the plan area to local economy.
- Program of prescribed fire and restoration is controlled by FS and plan components can guide how this is done.

Conclusion: Air Quality is a Key Ecosystem Service

Example: Air Quality

National Forest B:

- Air quality has suffered from the effects of pollution from external sources.
- Very small program of prescribed fire on a typically wet forest with little risk of major wildfire.
- Other FS programs generate little effect on air quality.

Is Air Quality a Key Ecosystem Service on National Forest B?

- Little declared concern about air quality specific to the plan area apart from general air quality concerns.
- No apparent opportunity for FS to substantially affect the air quality either through plans or projects.

Conclusion: Air Quality is not a Key Ecosystem Service

Example: Flood Control

National Forest E:

- Although there have been historic flooding problems, much of that problem has been resolved by the presence of dams within and below the national forest
- In discussions with the public, flood control has not arisen as a major concern related to the forest plan, primarily because the dams are considered to have resolved the problem.
- Management of the dams is the responsibility of the Army Corps of Engineers, not the Forest Service.

Is Flood Control a Key Ecosystem Service on National Forest E?

- Little declared concern about flood control specific to the plan area.
- No apparent opportunity for FS to substantially affect flood control either through plans or projects.

Conclusion: Flood Control is not a Key Ecosystem Service

Example: Flood Control

National Forest F:

- Substantial rains in the plan area trigger severe flooding downstream of the plan area affecting several towns and a small city. Climate change may exacerbate this problem.
- There has been a history of channelization and modification of stream courses both downstream and within the plan areas.
- There have been suggestions that a program of stream restoration and wetland creation may be able to mitigate this problem.

Is Flood Control a Key Ecosystem Service on National Forest F?

- There is declared concern and interest in having the plan revision address opportunities for flood control.
- It is unclear if the plan area actually has opportunities within FS authority and the land's capability to influence flood control.

Conclusion: Flood Control is tentatively identified as a Key Ecosystem Service, pending evaluation of opportunities of the plan to address flood control.

Evaluating key ecosystem services in the assessment

- 1. Key ecosystem services contributions by the plan area.**
- 2. The geographic scale at which the plan area contributes to ecosystem services (for example, watersheds, counties, regional markets, or eco-regions).**
- 3. The condition and trend of these key ecosystem services.**
- 4. Drivers likely to affect future demand for and availability of key ecosystem services.**
- 5. The stability or resiliency of the ecosystems or key characteristics of ecosystems that currently maintain the plan area's key ecosystem services.**
- 6. Influence of non-NFS lands or other conditions beyond the authority of the Forest Service that influence the plan area's ability to provide ecosystem services.**

Key Ecosystem Services in the Land Management Plan

- Plan components (desired conditions, objectives, suitability, standards and guidelines) do not need to be designed explicitly for a specific key ecosystem service, but there should be a linkage between each of the key ecosystem services and plan components.
- A plan component may directly provide a key ecosystem service:
 - Management area for nonmotorized recreation
 - Lands suitable for timber production
- Or indirectly
 - Guidelines for prescribed burning that provide for air quality.
 - A desired condition for vegetative diversity in age classes provides for big game hunting opportunities.

But the key ecosystem services have a linkage to plan components!

Key Ecosystem Services in the Environmental Impact Statement (EIS)

- Each key ecosystem service is expected to be tracked in the EIS in the effects of different alternatives and possibly in the design of those alternatives.
- Each alternative should have an associated set of key ecosystem services.
- Alternatives being considered should track different levels of key ecosystem services either quantitatively or qualitatively, ideally with indicators developed in the assessment.
- The EIS should display the tradeoffs in key ecosystem services among the different alternatives.

INYO (CA)	FLATHEAD (MT)	FRANCIS MARION (SC)	RIO GRANDE (CO)	CIBOLA (NM)
Water	Water			Watersheds
Timber/Biomass	Forest Products	Natural fibers	Timber/Forest Products	Wood fiber
Grazing	Air	Air purification	Forage	Grazing
Fish/Game	Fish/wildlife	Food production	Fish/wildlife	Fish/wildlife
Energy			Mineral deposits	Energy/Minerals
Recreation	recreation		Recreation/Scenery	Recreation/Scenery
Aesthetics	Scenery			Air
Heritage/Place	Inspiration/culture	Culture/Heritage	Cultural/Historic	Cultural/Tribal/Historic
Education	Research/Education	Aesthetics/Spiritual	Solitude/Escape	Land use/infrastructure
Water Quality				
Water regulation	Flood Control	Water purification	Water	Water Resource
Carbon Sequestration	Carbon Sequestration	Carbon Sequestration		Carbon storage
Ecosystem Resilience	Non-use values	Nutrient Cycling		Soils
At Risk species		Natural Hazard	Habitats/species diversity	Species Viability
Biodiversity		Pollination	Pollination	Vegetation

CHUGACH (AK)	NEZ PERCE CLEARWATER (ID)	NANTAHALAH PISGAH (NC)	EL YUNQUE (PR)
Water quantity/quality	Clean water	Clean water-health	water, water purification, rainfall
Animals/plant foods	Fish/Wildlife	Hunting/fishing family food	
Wood fuel	Wood products	Economy-timber-jobs	Forest products
	Clean air	Clean air-health	Air purification
	Forage		
	Aesthetics		Scenic value, spiritual value
	Cultural/Heritage		
Recreation	Recreation	Recreation-hiking-camping- nature	Recreation
Education and research		Economy tourism-jobs	Research and education
	Soil stabilization		Soil formation, nutrient cycling
Biodiversity		Wildlife habitat diversity Nature	Flora and fauna , habitat, biodiversity
	Carbon Sequestration		Carbon Sequestration, oxygen
	Flood Control		

Discussions / Questions

- Assistance for this presentation from Chris Miller, Kawa Ng, Delilah Jaworski, Henry Eichmann of USDA Forest Service

