

# An Overview of Ecosystem Services in Forest Planning

## A 2012 Planning Rule Requirement

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This technical advice bulletin is provided to help forest plan revision teams describe how people benefit from the forest plan area and how those benefits might change as a result of plan revision. These benefits are what we call “ecosystem services.”

It is important to note that there is no single recommended procedure for addressing ecosystem services during assessment, plan revision, or monitoring phases of planning. Planning teams and responsible officials have the flexibility to adopt procedures, methods, and engagement strategies that best meet the needs of their national forest or grassland. This advice bulletin is intended to help teams establish their own preferred strategy for addressing ecosystem services. It provides a brief conceptual overview of ecosystem services and related requirements in the 2012 Planning Rule to help planning teams consider ecosystem services in assessments, plans and associated environmental analysis, as well as monitoring.

### What are ecosystem services?

The definition of ecosystem services in the 2012 Planning Rule (36 CFR 219.19) includes four categories of services with examples:

*“Ecosystem services. Benefits people obtain from ecosystems, including:*

- Provisioning services, such as clean air and fresh water, energy, fuel, forage, fiber, and minerals;
- Regulating services, such as long term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation;
- Supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and
- Cultural services, such as educational, aesthetic, spiritual and cultural heritage values, recreational experiences and tourism opportunities.”

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Although researchers, policymakers, and practitioners have adopted various definitions of ecosystem services<sup>2</sup>, the definition in the 2012 Rule is based on the Millennium Ecosystem Assessment (MEA) classification typology.<sup>3</sup> While the MEA classification scheme is useful for identification of ecosystem services, teams may wish to use or develop other terms or classification systems for forest benefits.

### **Why consider ecosystem services in planning?**

The simple answer is stated in our Forest Service mission: “To sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.” Identifying and evaluating ecosystem services in planning helps ensure we are meeting the needs of present and future generations (benefits people obtain from ecosystems).

Forest management and planning has traditionally addressed a broad spectrum of natural resource and ecological issues and conditions as a result of complying with land management regulations and policy.<sup>4</sup> However, accounting for and communicating the benefits of addressing those issues and conditions in decision-making can be challenging.

During forest planning, managers and responsible officials are often tasked with evaluating the effects or benefits of management decisions that allocate forest resources across different uses (such as determining where off-highway vehicle use will occur, where wilderness should be proposed, or where timber cutting is suitable).

Evaluating benefits implies some understanding about:

- tradeoffs among goods and services produced under alternative plans (What forest goods and services are given up to produce other goods and services?), and
- the relative worth or values for goods and services (What are people willing to give up to have a good or service?).

Ecosystem services can be considered the goods and services derived from forest resources. Although some ecosystem services, such as wood products, are easily quantified and valued in monetary terms, other ecosystem services are not. For example, it is difficult to quantify and assign monetary value to cultural

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<sup>2</sup> See for example: Boyd, J.W.; Banzhaf, S. 2006. What are ecosystem services? The need for standardized environmental accounting units. Discussion paper RFF-DP-06-02. Washington, DC: Resources for the Future. 26 p.; U.S. Environmental Protection Agency [US EPA]. 2006. Ecological benefits assessment strategic plan. EPA-240-R-06-001. Washington, DC: Office of the Administrator (29 September 2015).

<sup>3</sup> Millennium Ecosystem Assessment [MEA]. 2005. Ecosystems and human wellbeing: synthesis. Washington, DC: Island Press. 137 p.

<sup>4</sup> Multiple Use Sustained Yield Act, National Forest Management Act, 1982 Planning Rule (replaced by 2012 National Forest Planning Rule); and National Environmental Policy Act.

experiences. Because of this, there is a perception that the benefits of many ecosystem services are not fully accounted for in decisionmaking. Evaluating tradeoffs and values is further complicated because we often do not have a clear or shared understanding about the full spectrum of ecosystem services provided by forest resources, or the production links between forest resources and the flows of ecosystem services within a broader landscape over time.

The success of forest planning decisions relies on participants having a common means of communicating information about the benefits obtained from forest resources. At the most fundamental level, ecosystem services rely on characteristics of nature to describe the ways in which people benefit from forest ecosystems. As a result, the ecosystem services concept:

- Serves as a common language to characterize how forest resources and management decisions generate benefits and impact people's wellbeing;
- Increases our ability to recognize and communicate potential tradeoffs when comparing alternative plans (understanding tradeoffs is the building block for describing values and preferences);
- Clarifies how non-agency stakeholders, stewards, and landowners contribute to benefits within the broader landscape; and ultimately,
- Provides the foundation for understanding the production of forest goods and services within the plan area and broader landscape.

Forest planning involves evaluating and revising desired conditions and objectives across a variety of ecosystems within the plan area. Under the 2012 Planning Rule, these revisions are expected to reflect new information as well as uncertainty about stressors, drivers, and concerns about changes in resource conditions and trends. Evaluating ecosystem services for land management planning may therefore consider:

- A broad set of potentially important and relevant ecosystem services as a step in ultimately identifying a subset of key ecosystem services,
- The effects of a number of stressors and drivers on the provision of ecosystem services, and
- Production linkages between a variety of resource conditions and ecosystem services.

Integrating ecosystem services concepts into all aspects of land management planning will help planning teams disclose and evaluate the consequences that planning decisions may have on different ecosystem services and benefits to people. Strategically integrating relevant key ecosystem services throughout the forest plan helps produce a more meaningful evaluation. The 2012 Planning Rule provides the framework to effectively consider and integrate ecosystem services into forest planning.

## **How do we consider and evaluate ecosystem services in forest planning?**

The definition of ecosystem services in the Planning Rule on page 1 provides a framework for considering the range of benefits people derive from a forest plan area. However, planning teams are not required to categorize their ecosystem services this way. Planning teams may decide to simply refer to forest benefits and ecological integrity, instead of using the term ecosystem services (which meets the intent of the 2012 Planning rule as long as the range of benefits described in the planning rule definition is covered). Planning teams may also find it more efficient to address supporting and regulating services as ecological processes or functions that help sustain a variety of other provisioning or cultural ecosystem services. Planning teams should explain how ecological processes and functions help provide for key ecosystem services to ensure that the importance and benefits of different forest resource and program specialist areas are recognized and accounted for in planning.

The 2012 Planning Rule provides substantial discretion and flexibility to the responsible official about how the planning process is conducted, and how plans are written and evaluated to satisfy the requirement to address ecosystem services. The rule does not require that forest plans identify or provide for each and every ecosystem service occurring on a national forest or grassland, or achieve a specific level of ecosystem services. Separation of ecosystem services from multiple uses is also not required or expected. In fact, the integration of the two would be helpful and is encouraged in many instances.

Furthermore, monetary valuation of specific ecosystem services is not a requirement in land management plans (or in its analyses), though nothing precludes the responsible official (and planning teams) from exploring and referencing monetary values that are defensible and consistent with best available scientific information (BASI). Presenting readily available information about the values of ecosystem services can help characterize the importance of key ecosystem services. When discussing values, try to describe the value of the national forest's or grassland's contribution to an ecosystem service, not simply the value of the ecosystem service as a whole. For example, if you discuss the total value of water supplies in an area or region, then you should attempt to discuss how much the national forest contributes to that supply and the incremental value of water contributed by the forest unit.

### **Ecosystem Services and the Plan Assessment**

The 2012 Planning Rule states that the responsible official shall identify and evaluate existing information relevant to the plan area for benefits people obtain from the planning area (ecosystem services) as part of the plan assessment (219.6). The planning directives (FSH 1909.12, ch. 10, sec. 13.12) further specify that the assessment focus on those ecosystem services that are (1) important outside the plan area itself, in areas of influence or the broader landscape, and (2) likely to be influenced by the management plan. These

ecosystem services are referred to as “key” ecosystem services. The list and description of key ecosystem services initially identified in the assessment may be modified, expanded, or reduced based on information obtained later in the planning process.

The planning directives (section 13.12) also note that the interdisciplinary team should identify and evaluate available information about each of the identified key ecosystem services, including the geographic scale, conditions, and trends of key services. Information should also be evaluated to help describe the role of critical ecosystem components, lands outside the plan area, drivers and stressors, and socio-economic conditions in the production of, and demand for key ecosystem services.

Information of this nature can help answer questions about key ecosystem services that are useful in the development or revision of alternative plan components. For example:

- Who is benefiting from the national forest, what forest resources are those people using and enjoying, and at what geographic scale is this occurring? How is the use of forest resources changing over time? Are there competing or contentious uses or activities occurring within the national forest?
- How has the condition of forest resources that are responsible for sustaining ecosystem services and benefits changed over time?
- How are activities and management decisions on lands outside the plan area affecting the ability to provide key ecosystem services?
- How are ecosystem services contributing to local economies and jobs?

### **Ecosystem Services in Forest Plan Components and Environmental Analysis**

The 2012 Planning Rule requires that plans include plan components that “guide the plan area’s contribution to social and economic sustainability, taking into account: ecosystem services” (219.8). The rule also requires that plans include plan components for integrated resource management to provide for ecosystem services and multiple uses in the plan area. When developing plan components for integrated resource management, the responsible official shall consider ecosystem services including a broad spectrum of renewable and non-renewable resource attributes, uses, and opportunities (219.10). The responsible official and planning team have discretion and substantial flexibility on how they satisfy these requirements, similar to ecosystem service assessment requirements.

Plan components for a variety of resource and program areas should be written and integrated to ensure they work together in providing ecosystem services. Plan components should focus on ecosystem service contributions, rather than committing the national forest to specific social and economic conditions. The links between plan components and ecosystem services can be demonstrated in plan component language itself, other sections of the plan (such as roles and contributions, related resource sections), or the EIS.

Language from the Planning Rule preamble states that “Under NEPA, environmental documents will discuss comparative benefits and tradeoffs associated with ecosystem services” [36 CFR 219 preamble]. The effects of plan components on ecosystem services have two dimensions: (i) provision or supply (amount and quality of a service) that can build from information or indicators already established in other resource or program areas, and (ii) social or economic effects that can rely on descriptions of beneficiaries and their corresponding needs for, or satisfaction with key ecosystem services.

### **Ecosystem Services and Plan Monitoring**

The 2012 Planning rule requires that we monitor progress towards meeting desired conditions. There is no planning rule language specifically directed at ecosystem services. Indirectly, there is the need to monitor resource conditions, operations, and infrastructure that are linked to provision of key ecosystem services, or for those ecosystem services themselves that are included in objectives or desired conditions in a forest plan.

Examples of monitoring questions and indicators from the Forest Service Handbook (FSH 1909.17, chapter 10) for planning provide context to help clarify the relationship between monitoring and ecosystem services.

### **For More Information**

Additional advice and tools for addressing ecosystem services in the assessment phase of planning include:

- “A Brief Guide (Overview) to Assessing Ecosystem Services in Forest Planning”, and
- “Ecosystem Service Assessment Process” – An example of a five step process for identifying key ecosystem services.