



The Effects of Federal Policies on Rangeland Ecosystem Services in the Southwestern United States

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On the Ground

- Rangelands provide a wide array of ecosystem services – the direct benefits people receive from nature. There is increasing interest by policymakers and conservationists in managing for these ecosystem services.
- Because of complex land tenure arrangements in the Intermountain West, it is important to understand the impacts of federal resource management laws on ecosystem services flowing from public and private lands.
- All major federal land management laws are supportive of managing for ecosystem services. We review the implications of FLPMA, NFMA, NEPA, ESA, and CWA on ecosystem services on public and private lands.

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rangelands, when managed sustainably, provide four types of ecosystem services:

- *Provisioning services* supply sources of forage for livestock and wildlife; food for humans, such as from beef production; and renewable resources, such as timber.
- *Supporting services* sustain the basic functioning of rangeland ecosystems through nutrient cycling in soil, photosynthesis by plants, and other means.
- *Protecting services* help nature absorb, or regulate, potentially harmful disturbances, such as by buffering against flooding in heavy rains.
- *Cultural services* provide a basis for human enjoyment through recreation and tourism, and support spiritual, religious, or aesthetic values.

Across the Southwest and elsewhere, there is growing interest among landowners, resource managers, and researchers to better understand how ecosystems—such as rangelands, forests, and streamside areas—function and to identify the types and value of the services they provide to society.² Relatedly, there is a need to look more closely—from the perspective of ecosystem services—at the effects of different resource management approaches to see which options yield the most benefits, and why.^{3–5} Knowledge from such studies could guide policies and programs for land management, such as providing economic incentives to private landowners to help them sustain existing ecosystem services or derive new ones from their lands.⁶ As it stands now, there are few incentive programs, economic or otherwise, to encourage landowners to maintain or generate ecosystem services through sustainable range management.

Although the concept of ecosystem services has emerged as a tool for natural resources management, generally, its use for rangeland management is limited. Several publications—including articles in a special issue of *Rangelands* (October 2011)—have discussed ecosystem services provided by sustainable range management, showing a clear interest in the topic by researchers and land managers.^{7,8} However, there are few documented

When the rains come to the Southwest, often as downpours, healthy expanses of grassland capture and slow the flow of the storm water and, in the process, help recharge groundwater and control erosion. The range thus provides—in addition to forage for livestock and habitat for wildlife—many benefits, such as flood control, water supply, and soil protection. These benefits—that people receive directly or indirectly from nature—are called *ecosystem services*.¹ In general, Southwestern

examples of policies or programs that explicitly consider ecosystem services as a factor in decision making. This is particularly striking for federal laws and regulations, which guide resource management for significant portions of the western United States.

Federal Policies and Rangeland Ecosystem Services

All of the major public land management laws predate the emergence of the ecosystem service framework as an approach to analyze and manage natural resources. Despite this, federal natural resources policies do influence what, how, and where ecosystem services are produced on Southwestern rangelands, especially on public lands.

Five federal laws, in particular, have a disproportionate effect on public lands used for livestock grazing: the Federal Land Policy and Management Act (FLPMA), the National Forest Management Act (NFMA), the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), and the Clean Water Act (CWA). The first two laws govern the core functions, respectively, of the Bureau of Land Management (BLM) and the U.S. Forest Service, which manage most of the public lands on which grazing takes place. The latter three laws guide key national environmental policies.

In the following sections, we describe the purpose and intent of these laws and their related policies. We review the potential effects the laws might have on the provision of ecosystem services from public rangelands. We also note when and how each law might affect ecosystem services on private land.

Federal Land Policy and Management Act

Purpose

The FLPMA authorizes the BLM to manage public lands with a stated goal of multiple use and sustained yield. The FLPMA requires comprehensive land-use planning for all BLM lands, defines the basic functions of the agency, and provides guidelines to manage grazing lands and rights of way.

Effects on Public Lands

While the term ecosystem services does not appear in the FLPMA, the law does affect the provision of ecosystem services from BLM lands simply by regulating the management of those lands. The FLPMA contains several formal declarations of policy, stating that:

the public lands [will] be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.⁹

In essence, this policy calls for the maintenance of ecosystem services on BLM-managed lands.

Resource management plan

The FLPMA requires the BLM to develop resource management plans for the public lands it manages. A resource management plan provides general direction for how the BLM will manage lands in a given region to meet the agencies objectives for multiple use and sustained yield. Resource management plans are typically developed at the field office or unit level. For example, in Arizona, there are separate resource management plans in place for the Ironwood Forest National Monument, a monument managed by the BLM, and for the Lower Sonoran Decision Area, an area managed by the BLM's Lower Sonoran Field Office.

The FLPMA provides only general guidelines to develop resource management plans. The law contains no requirement for how frequently plans must be developed or updated. In creating plans, the BLM is required to follow the principles of multiple use and sustained yield, apply an interdisciplinary approach that considers both natural resources management and economics, prioritize protection of areas designated as having special environmental values, consider all potential uses of public lands, consider long-term and short-term benefits of planning decisions, comply with applicable pollution control laws, and coordinate with other agencies and Native American tribes.

In practice, the BLM resource management plans generally do not apply an ecosystem services framework. For example, the recently completed Lower Sonoran Resource Management Plan in Arizona makes no mention of the phrase ecosystem services. However, the BLM plans do affect the provision of ecosystem services from the lands the agency manages. The decisions made in a resource management plan—including those about grazing, recreation, and conservation planning—have a significant impact on the ability of the planning unit to continue to provide certain ecosystem services. Furthermore, the effects of BLM planning on ecosystem services are specific to each resource management plan.

Public lands grazing management

The FLPMA also contains regulations for grazing on federal lands, including rules for grazing fees, leases, and permits. The federal grazing program is a use of a provisioning ecosystem service—forage—provided by the public lands. The FLPMA acknowledges that public rangelands in the western United States were degraded at the time the Act was passed in 1976. The law seeks to improve range conditions by modifying the grazing program and authorizing funding for range improvements. In effect, these policies seek to improve the flow of ecosystem services from public rangelands.

The BLM and the U.S. Forest Service (only for forests in the 16 western states, excluding Hawaii and Alaska) have discretionary authority to develop allotment management plans for grazing. Allotment management plans specify how grazing and range management will take place on a given allotment, including the size of the herd and the seasons the allotment may be used for grazing. The conditions set out in the allotment management plan, or in the grazing permit itself, will impact the type and quantity of ecosystem services provided by public lands.

Effects on Private Lands

The FLPMA applies only to federal lands managed by the BLM (and the U.S. Forest Service as it relates to grazing

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