

Rio Grande National Forest – Draft Assessment 7 Ecosystem Services



Contents

Introduction	3
Information Sources and Gaps.....	3
Existing Forest Plan Direction.....	4
Provisioning Services	4
Fish and Wildlife.....	4
Forage	4
Mineral Deposits.....	4
Non-Timber Forest Products.....	5
Timber.....	5
Cultural Services.....	5
Cultural, Historic and Sacred sites.....	6
Landscapes and features providing recreation and scenery	6
Solitude, spirituality and sense of escape.....	6
Regulating Services	7
Water Quality, Quantity, Storage and Flood Control	7
Supporting Services.....	7
Pollination.....	8
Support of habitat and species diversity, abundance and distribution	8

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Introduction

This section of the assessment provides information characterizing the benefits people receive from ecosystems on the Rio Grande National Forest. Benefits are derived from the “components of nature, directly enjoyed, consumed, or used to yield human well-being” are collectively known as ecosystem services (Boyd and Banzhaf 2007). People, or beneficiaries, derive human well-being from the components of nature they directly enjoy, consume, or use (Boyd and Banzhaf 2007). Thus, ecosystem services are the benefits that people, or beneficiaries, obtain from ecosystems. Ecosystem services are a useful framework for helping stakeholders identify and understand services provided by the forest and their use and dependence on those services.

The benefits of ecosystem services provided by the Rio Grande National Forest are described qualitatively in this assessment. Because these benefits are often difficult to quantify, impacts on these services can often be neglected during forest planning. The term “benefit” is used to capture the idea that benefits, even when they are not directly relatable to dollars spent or received, still contribute to improving quality of life for area communities. Examples of these types of non-monetary benefits are provided by key ecosystem services such as cultural heritage and biodiversity. In contrast, examples of key services that are more directly related to monetary value are recreation, timber and water. This broad consideration of benefits (both monetary and non-monetary) provides a more comprehensive consideration of Rio Grande National Forest ecosystem services and their beneficiaries.

Key ecosystem services are the ecosystem services important in the broader landscape and likely to be influenced by the land management plan. Identification of key ecosystem services will assist development of plan components, and tradeoffs to ecosystem services beneficiaries, in the next stage of the planning process. For example, prescribed fire has watershed health benefits which improve water quality important for agricultural supply, fishing and other uses. So while areas may be closed during treatment, and some effect on scenery may result, there will be a long term benefit to ecosystem services from these actions supporting watershed health. This is useful information to consider during development of the land management plan and when effects of management are analyzed.

The condition and trend of these ecosystem services are dependent on the underlying resources that support them. Therefore, the information for this assessment relies on the specific resource assessments that were conducted in the other assessment sections. Thus ecosystem services are described below with a reference to other assessment sections containing information on conditions, trends and stressors.

The United Nations sponsored Millennium Ecosystem Assessment identified four major categories of ecosystem services: provisioning, regulating, cultural and supporting services (MEA 2005). Key services were identified through discussion with the Rio Grande National Forest staff and public involvement completed in support of the assessment.

Information Sources and Gaps

The characterization of key ecosystem services was dependent on workshops and discussions with forest staff held during the preparation of the assessment. In addition, input from public involvement, performed in support of this assessment, provided additional information on ecosystems benefiting communities surrounding the Rio Grande National Forest.

Existing Forest Plan Direction

There is no existing forest plan direction specific to ecosystem services. However, forest plan direction does exist for resource areas covering the identified key ecosystem services below. Forest plan direction, for these ecosystems, is discussed in the sections referenced below.

Provisioning Services

Provisioning services, or products derived from forest lands, are those products extracted from ecosystems for human benefit. Provisioning services provided by the Rio Grande National Forest include Forage, Mineral deposits, Non Timber Forest Products and Timber.

Fish and Wildlife

Communities in the local area, and from around the world, use and enjoy the fish and wildlife produced by habitats on the Rio Grande National Forest. Species include desirable native and non-native species (i.e. stocked fish). Hunting, Fishing, wildlife watching and subsistence are important uses of this ecosystem service. As a result these species, and their habitats, contribute to the local economy and the heritage and culture of local communities. For example, they contribute to food sources, recreation, jobs and spending of tourism dollars in the local area.

For more information on species that are commonly hunted or special interest species see the Fish, Wildlife and Plants section of Assessment 8 – “Multiple Uses”. Additional species are covered in Assessment section 5- “Threatened, endangered, proposed and candidate species, and potential species of conservation concern” Additional information on species habitats and trends, stressors and drivers can be found in Assessment section 1 – “Terrestrial ecosystems, aquatic ecosystems, and watersheds” and Assessment section 3. Social and economic contributions associated with wildlife related recreation are discussed in Assessment section 6 – “Social, cultural, and economic conditions” which includes a discussion of subsistence use (see sections on the *Recreational community of interest - consumptive, including hunting, fishing and food pickers/gathers* and the Recreation section under *Forest Economic Contributions*. . A discussion of medicinal and plants of cultural importance (Osha, chamisa, etc.) is included in Assessment 13- “Cultural and historical resources and uses”.

Forage

Forage is important to cattle and sheep ranchers who utilize rangelands on the Rio Grande National Forest. These permittees rely on Rio Grande National Forest forage for commercial operations and some small-scale subsistence use. In addition, this ecosystem service contributes to a sense of place; preserving a rural way of life, culture and heritage. Rangelands are defined as all lands producing, or capable of producing, native forage for grazing and browsing animals, and lands that have been revegetated naturally or artificially to provide a forage cover that is managed like native vegetation. They include all grasslands, forb lands and shrublands; and those forested lands that can, continually or periodically, naturally or through management, support an understory of herbaceous or shrubby vegetation that is forage for grazing or browsing animals.

For more information on conditions trends and stressors see the Forage portion of Assessment 8 on “Multiple uses” and Assessment 6 on “Social, cultural and economic conditions” for a discussion of social and economic contributions.

Mineral Deposits

The forest provides a variety of mineral uses (discusses in Assessment 10 on Energy, Minerals and Geologic Hazards) such as locatable operations (the large Rio Grande Silver mine in Creede), saleable

mineral material (providing stone, gravel and other material to the public with a permit) and leasable minerals (no current development of oil and gas exists but future projections exist). In addition, recreational mineral collection (panning, dredging, sluice-box and metal detector use) occurs on the forest.

For more information on conditions trends and stressors see Assessment 10 on “Energy, Minerals, and Geologic Hazards”, see Assessment 6 on “Social, cultural and economic conditions” for a discussion of social and economic contributions and see Assessment 13 – “Cultural and historical resources and uses” for details on mining’s role in the area’s history and early economy.

Non-Timber Forest Products

The Rio Grande National Forest has supported generations of local residents by providing forest products used for home heating, cooking, construction (Vegas and Vigas) and other needs (food, crafts, medicine, etc.). Fuelwood is a particularly important forest product provided by the Rio Grande National Forest; and in some areas fuelwood gathering is a necessity, not a luxury, since people heat their homes and cook with wood-burning stoves (Raish 2000). Other material collected includes material for art supplies, cones, pinon nuts, mushrooms, material for bows, and transplants. Collection of these materials supports recreation, preservation of rural way of life, cultural integrity and spiritual fulfillment.

See Assessment 6 on “Social, cultural and economic conditions” for a discussion of subsistence, environmental justice and social and economic contributions from Non-timber forest products. Recreational importance is discussed in Assessment 9 on “Recreation settings, opportunities and access, and scenic character”. A discussion of medicinal and plants of cultural importance (Osha, chamisa, etc.) is included in Assessment 13- “Cultural and historical resources and uses”. Assessment 3 [title?] covers conditions, trends and stressors of terrestrial and aquatic ecosystems that support habitat providing non-timber forest products.

Timber

Timber harvest and thinning provides forest products and contribute to the local economy. Local processors utilize material from the forest and it’s made available for purchase locally. Timber harvest provides wood products and may be used for improving wildlife habitat, making the forest more resilient to disturbances such as fire, insects, and disease, and improving tree growth. Currently on the Rio Grande National Forest, timber is sold thru timber sales and permits related to firewood and other products such as posts and poles. This use benefits the local timber industry and creates jobs important to poor communities lacking employment opportunities, within the San Luis Valley and surrounding area.

For more information on conditions trends and stressors see the Timber portion of Assessment 8 on “Multiple uses” and Assessment 6 on “Social, cultural and economic conditions” for a discussion of social and economic contributions associated with timber from the Rio Grande National Forest.

Cultural Services

Cultural Services relate to the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences (MEA 2005). These benefits often influence the way people view and value other goods and services provided by the forest. Internal discussion with forest staff and public involvement in support of the assessment indicated the forest provides many cultural services such as Cultural, Historic and Sacred sites, Landscapes and features for outdoor recreation, scenery and viewsheds and solitude, spirituality and sense of escape.

Cultural, Historic and Sacred sites

The physical and cultural landscape of the Rio Grande National Forest has evolved over time. Cultural ties have left lasting identities for communities within the San Luis Valley and other areas surrounding the forest. The cultural and sacred features of the forest help people form attachments to places and provide an understanding of their place in the natural and cultural environment. Assessment 13 on Cultural and Historic Resources acknowledges that “cultural and historic resources with the plan area represent the processes and events important to the identity and history of local and tribal communities. Contemporary uses of resources and places within the plan area by American Indian, Hispanic and Anglo-American traditional communities are critical to maintaining the cultural identity of these communities.” These heritage values are a source of pride and contribute to a sense of community and individual identity. Communities dependent on access and resource condition on sacred sites, include affiliated tribes, locals, recreationist, the general public and others interested in historic land grants. By providing access and integrity of these sites the forest provides a link to land of their ancestors, a sense of place, opportunities for interpretive learning and fosters traditional uses.

For more information on resources of cultural, historic and sacred importance see Assessment 13 - “Cultural and Historic Resources” and Assessment 12 – “Areas of tribal importance”. Additional information on communities interested in protection and access to resources of cultural importance see Assessment 6 – “Social, cultural, and economic conditions”.

Landscapes and features providing recreation and scenery

Developed and undeveloped landscape features of the Rio Grande National Forest are an ecosystem service that support recreation opportunities year round. The geophysical and ecological settings on the forest provide opportunities that users depend upon for a variety of wildlife related recreation and other activities. These opportunities and recreational activities help foster wellness, personal enrichment, opportunities for people to connect to each other and a suite of other experiences. Landscapes and features also provide scenic resources appreciated by local residents, recreationists (railroad riders, driving for pleasure, hikers, etc.), artists, people seeking inspiration, and other visitors to the Rio Grande National Forest. Recreationists, local outfitters and guides directly benefit from these landscapes and features while local businesses benefit from spending by forest visitors.

For more information on recreation settings see Assessment 9 – “Recreation settings, opportunities and access, and scenic character”. For more information on species that are commonly hunted or special interest species see the Fish, Wildlife and Plants section of Assessment 8 – “Multiple Uses”. Additional species are covered in Assessment section 5- “Threatened, endangered, proposed and candidate species, and potential species of conservation concern” Additional information on species habitats and trends, stressors and drivers can be found in Assessment 1 – “Terrestrial ecosystems, aquatic ecosystems, and watersheds” and Assessment 3. Social and economic contributions, associated with wildlife related recreation and other activities are discussed in Assessment section 6 – “Social, cultural, and economic conditions”. Assessment 6 also includes a discussion of communities interested in consumptive and non-consumptive recreation.

Solitude, spirituality and sense of escape

Forests possess intrinsic values, enjoyed by forest users that accrue in addition to provisioning services discussed above. For example the Rio Grande National Forest contains landscapes that provide aesthetic enjoyment, artistic and spiritual inspiration, and emotional comfort. While current populations are increasingly centered around cities, the mental, physical, and spiritual well-being of people continues to have strong ties with the natural environment. Undeveloped landscapes offer a refuge and a place where people can reconnect with nature to escape the stresses of everyday life. Many people retreat to forests

because they foster a sense of oneness with nature which can stimulate contemplation, exploration of identity and spirituality.

While specific sites may be used in religious rituals, forests are often described as spiritual landscapes because they provide an experience of being related to, or in touch with, an ‘*other*’ that transcends their individual sense of self and gives their life a deeper meaning beyond an intellectual level (Schroeder, 1992). Spiritual experiences in nature are generally intuitive or emotional and tend to create a sense of being caught up or carried away. Opportunities to explore and enjoy the scenic beauty of the natural environment have been known to fill and inspire people with a feeling, an idea, or a creative impulse. Forests have long served as inspiration for a wide range of artistic and cultural expressions, including: film, literature, photography, paintings, sculptures, music and dance, fashion, folklore, national symbols, and even architecture and advertisement (Rudolph de Groot et al. 2005).

For more information on recreation settings related to experiences enabling Solitude, spirituality and sense of escape see Assessment 9 – “Recreation settings, opportunities and access, and scenic character”. Assessment section 6 – “Social, cultural, and economic conditions” contains a discussion of communities interested in Non-Use Values (those who derive benefits from the existence and bequest values of resources, including wildlife, a diverse ecosystem, viewsheds, designated areas, etc.) and non-consumptive Recreation.

Regulating Services

Regulating services are the benefits provided by ecosystem processes that moderate natural phenomena. Internal discussion with forest staff and public involvement in support of the assessment indicated the forest provides a host of regulating services such as carbon sequestration and terrestrial, aquatic and riparian ecosystems. Regulation of water quality, quantity, storage and flood control was found to be a “key ecosystem service.

Water Quality, Quantity, Storage and Flood Control

Forests act as natural treatment plants, natural reservoirs, and stormwater management systems. The Rio Grande National Forest contains physical, chemical, and biological characteristics that enable forest vegetation and soil to filter and absorb surface water; replenishing underground aquifers and moderating runoff during rainstorms. Water filtration services provided by well-functioning ecosystems help maintain the integrity of the watersheds and provide local communities with clean drinking water and water suitable for agricultural uses, recreation, and wildlife habitat. By filtering out pollutants upland forests, riparian areas, and wetlands help keep base loads within reasonable levels which reduce municipal and well-water treatment costs and alleviates demand for costly infrastructure. By managing for the health of forest ecosystems the FMNF directly contributes to regional water quality and helps reduce financial costs associated with quality of water supplies. In addition this regulating service benefits associated recreation uses on the forest such as fishing, boating, wildlife watching and enjoyment of scenery.

For information on water resources and watersheds see Assessment section 2 – “Air, soil, and water resources and quality” and the *Watersheds* portion of Assessment 8 – “Multiple Uses”.

Supporting Services

Supporting Services are the underlying natural processes which sustain ecosystems and enable the production of all other ecosystem services. Internal discussion with forest staff and public involvement in support of the assessment indicated the forest provides a host of supporting services such as pollination, soil production, nutrient cycling, etc. These were condensed into Pollination and a larger set of supporting

services titled “Support of habitat and species diversity, abundance and distribution” were found to be a “key ecosystem service”.

Pollination

Pollination is the fertilization of flowering plants through the transfer of pollen from the male part of the flower to the ovaries of the same species. Although some plant species are able to pollinate themselves, or may be pollinated by the wind, the vast majority of flowering plants need pollinators to help move pollen from the male to female parts of the plant. The Rio Grande National Forest provides habitat for pollinators with nesting grounds and food supplies for a variety of vertebrate and invertebrate pollinator species. Pollinators commonly seen on the forest include: bees, moths, butterflies, birds, deer, bear, rabbits and rodents. Communities benefiting from pollination include agricultural operations, recreationists and others who benefit from Rio Grande National Forest plant diversity and abundance.

For more information on trends, stressors and drivers of habitats that benefit from pollination see Assessment 1 – “Terrestrial ecosystems, aquatic ecosystems, and watersheds” and Assessment section 5 - “Threatened, endangered, proposed and candidate species, and potential species of conservation concern”. Information on species that are commonly hunted or special interest species see the Fish, Wildlife and Plants section of Assessment 8 – “Multiple Uses”. The Social and economic contributions, associated with wildlife and other recreation are discussed in Assessment section 6 – “Social, cultural, and economic conditions”. Assessment 6 also includes a discussion of communities interested in consumptive and non-consumptive recreation and uses, who benefit from pollination.

Support of habitat and species diversity, abundance and distribution

The Rio Grande National Forest sustains ecosystems on which plant and animal habitat depends. For example, soil formation, nutrient cycling, production of oxygen, and evapotranspiration are factors that influence and shape characteristics of ecosystems on the forest. In addition, processes support the diversity and abundance of plants and animals provided by these habitats and ecosystems. For example, reforestation, natural succession, genetic variability, migration and species interaction are shaped by these forest characteristics. Communities who benefit from these services include recreationists, researchers and student who benefit from opportunities for interpretation and learning. In addition these services support communities interested in traditional and cultural uses by supporting specific habitats important for subsistence and other uses. Recreationists, local ranchers, the timber industry, and users of non-timber forest products also benefit from this suite of services.

For more information on trends, stressors and drivers of habitats see Assessment 1 – “Terrestrial ecosystems, aquatic ecosystems, and watersheds”. For detail on specific species dependent on these habitats see Assessment section 5 - “Threatened, endangered, proposed and candidate species, and potential species of conservation concern” the Fish, Wildlife and Plants section of Assessment 8 – “Multiple Uses” (for information on species that are commonly hunted or special interest species). The Social and economic contributions, associated with supporting services and the other ecosystem services they provide are discussed in Assessment section 6 – “Social, cultural, and economic conditions”.