

INTRODUCTION

Biological diversity is defined as the full variety of life in an area including the ecosystems, plant and animal communities, species and genes, and the processes through which individual organisms interact with one another and with their environment (USDA Forest Service 1991). More simply it is defined as the variety of life and its processes (Keystone Report 1991). Special biological diversity features on SJPL include old growth forests, fens, Arizona fescue mountain grasslands, hanging gardens, critically imperiled species and communities, and unroaded lands.

LEGAL AND ADMINISTRATIVE FRAMEWORK

LAWS

- ***The National Forest Management Act of 1976***: This act states that forest plans must “provide for the diversity of plant and animal communities.”
- ***The National Environmental Policy Act of 1969***: This act promotes efforts designed to prevent or eliminate damage to the environment and biosphere, and enrich the understanding of the ecological systems and natural resources important to the nation.
- ***The Endangered Species Act of 1973***: This act authorizes the determination and listing of species as endangered and threatened. Section 7 of the Endangered Species Act requires Federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species, or to modify their critical habitat.

REGULATIONS AND POLICIES

- ***BLM Manual 6840***: This manual states that the “BLM should seek opportunities to conserve and improve special-status species and habitats for native animals and wildlife in the development of land use plans.”

AFFECTED ENVIRONMENT

EXISTING CONDITIONS AND TRENDS

Old-Growth Forests

Old-growth forests are unique ecosystems that are important components of biological diversity (Kaufmann et al. 1992; Mehl 1992). Biological values of old-growth forests include habitat for a variety of animal and plant species, pools of genetic resources, and long-term biological records of climate (Kaufmann et al. 1992). The formation of old-growth forests is slow; therefore, these ecosystems are essentially irreplaceable in this lifetime. Due to their rarity, old-growth ponderosa pine forests have particular biological diversity significance within the planning area (these forests have been extensively harvested in the past). Old individual trees that are not identified as part of an old-growth stand also have special biological diversity values associated with their genetics, their seed-producing capabilities, and their future as snags. (Old-growth forests within the planning area are described predominantly by Mehl (1992). See Appendix R, Volume III, for old-growth attributes). Currently, old-growth ponderosa pine, warm-dry mixed-conifer, and cool-moist mixed-conifer forests within the planning area are underrepresented when compared to the historic range of variability (HRV) conditions. This is especially the case for ponderosa pine forests, which account for only 2.7% of the total ponderosa pine type. Barring major disturbance events, all forest types will naturally succeed into older development stages, including the old-growth stage.

Fens

Fens, uncommon in the lower latitudes of the continental U.S., are relict (surviving remnants) wetlands from the last glaciation that have unique characteristics found nowhere else within the landscape. Fens occupy only a small percentage of land in the southern Rocky Mountains; however, they are an important element of biological diversity. They often support globally rare plants, bryophytes, lichens, invertebrates, and unique species assemblages (Cooper 1994; Cooper 1996). Within the planning area, fens have special biological diversity characteristics due to their rarity, unique hydrology, rare plant species, and organic soils (histosols). The formation of fens is slow; therefore, these ecosystems are essentially irreplaceable. Noteworthy fens within the planning area include the Chattanooga Iron Fen, the Cement Creek Iron Fen, the Burro Bridge Iron Fen, the South Mineral Creek Fen, the Harris Lake Fen, and the Grindstone Fen.

Currently, most fens located within the planning area display relatively unaltered conditions; however, some have been affected (impacted) by management activities, especially in relation to the construction and maintenance of roads. Future impacts to fens from management activities are projected to be minor.

Arizona Fescue Mountain Grasslands

Mountain grasslands are described as sensitive plant communities in the Rocky Mountain Region of the USFS. This is due to their limited extent, and to the fact that they have been heavily impacted by livestock grazing and land development (Mullen 1992). Since the time of the reference period, livestock grazing has significantly altered the composition, structure, and function of some mountain grasslands within the planning area. This is especially the case for the Arizona fescue type, which has been converted to a Kentucky bluegrass type in many places as a result of the extirpation of Arizona fescue (Romme et al. 2006). Arizona fescue mountain grasslands, where the ecological integrity is still intact, have special biological diversity significance within the planning area due to their rarity (as well as to the fact that cattle tend to spend a disproportionate amount of their time in this vegetation type foraging on the highly palatable Arizona fescue bunchgrass). The attainment of desired conditions, as well as the implementation of design criteria described in the DLMP/DEIS and in allotment management plans may help to minimize adverse impacts to these ecosystems.

Hanging Gardens

Within the planning area, hanging gardens are small communities found in the sandstone outcrops on the sideslopes of the Dolores River Canyon. These highly localized environments have perennial water sources (seeps) that form pocketed wetlands, which, in turn, allow for the draping of vegetation across wet cliff faces. Most hanging gardens are dominated by herbaceous plants; some are endemic to this region (including *Adiantum capillus-veneris*, *Mimulus eastwoodiae*, and *Erigeron kachinensis*). Within the planning area, hanging gardens have special biological diversity significance due to their rarity, associated rare plant species, and unique hydrology.

Currently, with regard to their physical environment and to their associated populations of rare plants, the hanging gardens located within the planning area appear to be stable. Future impacts related to management activities are projected to be minor.

Critically Impaired Species and Communities

Wild privet shrublands and Boxelder/River Birch woodlands are G1 plant communities that occur in riparian areas and wetlands ecosystems within the planning area. Gypsum Valley cat-eye, double bladderpod, Pagosa skyrocket, Colorado stickseed, and gypsum rim-lichen (*Lecanora gypsicola*) are G1 species that also occur within the planning area. These species and communities have special biological diversity significance because they are critically imperiled throughout their range and are extremely rare (often known as five or fewer extant occurrences or very few remaining individuals).

Currently, the critically imperiled species and communities located within the planning area appear to have stable populations. Future impacts from management activities are projected to be minor.

Unroaded Lands

Within the planning area, unroaded lands are places with special biological diversity significance. This is because they contain large acres of relatively unaltered ecosystems where natural disturbance processes are allowed to proceed with minimal human interference. In addition, they provide habitat for wide-ranging species and linkages that facilitate species movements and gene flow (Dobson et al. 1999). Unroaded lands act as reserves that protect the ecosystems, as well as the full range of biological diversity found within them. They may also provide suitable habitat for restoring missing predator species (including the wolverine and wolf). Unroaded lands within the planning area include Wilderness Areas, WSAs, RNAs, IRAs, and Semi-Primitive Non-Motorized (ROS) recreation areas.

ENVIRONMENTAL CONSEQUENCES

DIRECT AND INDIRECT IMPACTS

The impacts described below may occur in the future if, and when, specific projects are identified and implemented. In relation to expected impacts, it is assumed that the direction and design criteria described in the DLMP/DEIS, as well as the stipulations for oil and gas activity, would be followed and implemented. Under all of the alternatives, design criteria (environmental protection measures) would be applied at the project level in order to protect resources.

Impacts Related to Old-Growth Forests

Within the planning area, adverse impacts to old-growth forests from management activities may include the removal of old-growth attributes (including old trees, snags, and large wood on the forest floor), and may include fragmenting old-growth stands (due to the construction and maintenance of roads, well pads, campgrounds, utility corridors, or fire lines through them). The attainment of desired conditions, and the implementation of design criteria may help to minimize impacts.

DLMP/DEIS Alternatives: The impacts described above may result from the implementation of any of the alternatives. The impacts to old-growth forests, as described above, may be similar under all of the alternatives. The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to old-growth forests.

Impacts Related to Fens

Project design and design criteria that avoid or minimize impacts to fens would be implemented when projects associated with fens occur; therefore, adverse impacts to fens may not occur, may be minor, or may not affect the composition, structure, or function of these ecosystems.

DLMP/DEIS Alternatives: The impacts described above may result from the implementation of any of the alternatives. The impacts to fens may be similar under all of the alternatives. The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to fens.

Impacts Related to Arizona Fescue Mountain Grasslands

Within the planning area, livestock grazing may be the management activity with the greatest potential to adversely impact Arizona fescue mountain grasslands. Potential impacts may include a decrease in the abundance, distribution, and vigor of Arizona fescue and other native plant species, and the trampling of soils and plants. This may decrease the amount of ground cover (vegetation and litter) and increase the amount of bare soil, which, in turn, could lead to soil compaction, run-off, and erosion. Ground disturbance may also result in conditions conducive to the establishment of invasive plant species that can compete with native species, and lead to a reduction in the abundance and distribution of native species. The attainment of desired conditions and the implementation of design criteria (as described in the DLMP/DEIS and in allotment management plans) may help to minimize adverse impacts to these ecosystems.

DLMP/DEIS Alternatives: The impacts described above may result from the implementation of any of the alternatives. The impacts to Arizona fescue mountain grasslands may be similar under all of the alternatives. The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to Arizona fescue mountain grasslands.

Impacts Related to Hanging Gardens

Project design and design criteria that avoid or minimize impacts to hanging gardens would be implemented when projects associated with hanging gardens occur; therefore, adverse impacts may not occur, may be negligible, or may not affect the composition, structure, or function of these ecosystems.

DLMP/DEIS Alternatives: The impacts described above may result from the implementation of any of the alternatives. The impacts to hanging gardens may be similar under all of the alternatives. The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to hanging gardens.

Impacts Related to Critically Imperiled Species and Communities

Project design and design criteria that avoid or minimize impacts to critically imperiled species and communities would be implemented when projects associated with critically imperiled species and communities occur; therefore, adverse impacts may not occur, or may be negligible.

DLMP/DEIS Alternatives: The impacts described above may result from the implementation of any of the alternatives. The impacts to critically imperiled species and communities may be similar under all of the alternatives. The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to critically imperiled species and communities.

Impacts Related to Unroaded Lands

If unroaded lands are used for management activities (including oil and gas development, timber harvesting, mechanical fuels treatments, fire management, recreation development, utility corridors, and solid minerals development) then they would be subject to the impacts described in the Terrestrial Ecosystems and Plant Species section. These impacts may include those related to the construction of new roads (which would fragment these lands and provide an avenue for the invasion and establishment of invasive plant species). These impacts may also compromise the ability of unroaded lands to act as reserves, unaltered wildlife habitat, linkages that facilitate species movements and gene flow, and harbors of biological diversity.

DLMP/DEIS Alternatives: The impacts described above may result from the implementation of any of the alternatives. Alternative C would propose the most unroaded lands; therefore, it may provide the most acres of unaltered ecosystems and the most ecological benefits. Alternative B would propose the next highest amount of unroaded lands, followed by Alternative D. Alternative A would propose the least amount of unroaded lands; therefore, it may provide the least acreage of unaltered ecosystems and the least ecological benefits (as described above). The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to unro The No Leasing Scenario would have no ground-disturbing impacts, so it would have no adverse direct or indirect impacts to added lands.